INTERNATIONAL CODE COUNCIL
2012/2013 CODE DEVELOPMENT CYCLE
Group A (2012)

PROPOSED CHANGES TO THE
2012 EDITIONS OF THE

INTERNATIONAL BUILDING CODE®

INTERNATIONAL FUEL GAS CODE®

INTERNATIONAL MECHANICAL CODE®

INTERNATIONAL PLUMBING CODE®

INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE®

April 29th – May 8th, 2012
Sheraton Dallas Hotel
Dallas, TX

First Printing

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TABLE OF CONTENTS
(Group A)

PAGE

INTRODUCTION

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

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

2012 ICC CODE DEVELOPMENT HEARINGS

These proposed changes will be discussed in public hearings to be held on April 29th, 2012 through May 8th, 2012 at the Sheraton Dallas Hotel, Dallas, Texas. The code committees will conduct their public hearings in accordance with the schedule shown on page xxix.

REGISTRATION AND VOTING

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

Saturday, April 28th	4:00 pm to 6:00 pm
Sunday, April 29th through Tuesday, May 8th	7:30 am to 5:00 pm

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

> **5.7.4 Eligible Voters:** All members of ICC in attendance at the public hearing shall be eligible to vote on floor motions. Each member is entitled to one vote, except that each Governmental Member Voting Representative in attendance may vote on behalf of its Governmental Member. Code Development Committee members shall be eligible to vote on floor motions. Application, whether new or updated, for ICC membership must be received by the Code Council ten days prior to the commencement of the first day of the public hearing.

As such, new membership applications as well as renewal applications must be received by ICC's Member Services Department by April 18th, 2012. These records will be used to verify eligible voter status for the Code Development Hearings. Members are strongly encouraged to review their membership records for accuracy well in advance of the hearings so that any necessary changes are made prior to the April 18th, 2012 deadline. For information on application for new membership and membership renewal, please go to www.iccsafe.org/membership/join.html or call ICC Member Services at 1-888-ICC SAFE (422-7233)

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

ADVANCED REGISTRATION

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

CODE DEVELOPMENT PROCESS CHANGES

As noted in the posted Advisory Statement of February 4, 2009, the revised Code Development Process includes maintaining the current 3-year publication cycle with a single cycle of code development between code editions. The schedule for the 2012/2013 Code Development Cycle is the first schedule for the revised code development process (see page ix).

PROCEDURES

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

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

Section 1.6: **Recording.** This section was revised to clarify that ICC maintains sole ownership in the content of the hearings and has the right to control its subsequent distribution. In addition, the technology references were updated, using the term "recording" to replace "videotaping".

Section 2.4 **Emergency Procedures.** This section was revised create a 'metric' to aid in the determination of when an issue rises to the level of concern appropriate to an emergency amendment. Furthermore, it now stipulates a process by which a proposed Emergency Amendment is reviewed by the ICC Codes and Standards Council who is responsible for the implementation and oversight of ICC's Code Development Process.

Section 3.3.1 & Section 6.4.1 **Proponent.** An e-mail address for each code change/public comment proponent will be published in the monograph, unless the proponent requests otherwise.

Section 3.3.5.3 & Section 6.4.5 **Substantiation.** ICC evaluates whether substantiating material is germane, but the amendment makes it clear that ICC does not in all circumstances evaluate substantiating material for quality or accuracy.

Section 3.3.5.6 **Cost Impact.** The proponent should submit information that supports their claim regarding cost impact. Any information submitted will be considered by the code development committee. This language is intended to emphasize the need to provide information on how the proposed change will affect the cost of construction.

Section 3.6.3.1 If a proposed new standard is not submitted in at least draft form, the corresponding code change proposal shall be considered incomplete and shall not be processed.

Section 4.5.1 **Standards referenced in the I-Codes.** The deadline for availability of updated referenced standards and receipt by the Secretariat is December 1st of the third year of each code cycle. For the 2012/2013 cycle, the deadline is December 1st, 2014.

Section 5.2.2 **Conflict of interest.** The original language, "Violation thereof shall result in the immediate removal of the committee member from the committee." was removed because there was no mechanism to enforce it. The recourse for someone who feels this section has been violated is to appeal.

Section 5.4.2 **Open meetings.** A provision has been added that stipulates that participants shall not advocate a position on specific code changes with Committee Members other than through the methods provided in this policy.

Section 5.4.3
&
Section 7.3.3 **Presentation of Material at the Public Hearing.** All participants are to make it clear what interests they are representing. This disclosure provides additional information upon which to evaluate the testimony.

Section 5.7 **Assembly consideration.** A successful assembly action will no longer be the initial motion at the Final Action Consideration.

Section 5.7.3 **Assembly action.** A successful assembly action shall be a majority vote of the votes cast by eligible voters, rather than a 2/3 majority (see below).

Section 5.7.4 **Eligible voters.** This section is revised to clarify that each member, including Governmental Member Voting Representatives, gets only one vote.

Section 7.4 **Eligible voters.** This section requires that all Governmental Membership applications must be received by April 1 of the year of the Final Actions for a Governmental Member to be eligible to vote at the Final Action Hearings.

ASSEMBLY ACTION

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

- A successful assembly action now requires a simple majority rather than a 2/3 majority.
- After the committee decision on a code change proposal is announced by the moderator, any one in the assembly may make a motion for assembly action.
- After a motion for assembly action is made and seconded, the moderator calls for a floor vote in accordance with Section 5.7.2. *No additional testimony will be permitted.*
- A code change proposal that receives a successful assembly action will be placed on the Final Action Hearing Agenda for individual consideration.

MULTIPLE PART CODE CHANGE PROPOSALS

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

GROUP A AND GROUP B CODE CHANGES

Starting with this 2012/2013 Code Development Cycle, for the development of the 2015 Edition of the I-Codes, there are two groups of code development committees and they will meet in separate years. The groupings are as follows:

Group A Codes (Heard in 2012)	***Group B Codes (Heard in 2013)***
International Building Code Committees: *IBC-Fire Safety (Chapters: 7, 8, 9, 14, 26 and App. D)* *IBC-General (Chapters: 2-6, 12, 13, 27-34, App. A, B, C, F, H, K)* *IBC-Means of Egress (Chapters: 10, 11 and App. E)* *IBC-Structural (Chapters: 15-25 and App. G,I, J, L, M)*	*Administrative Provisions (Chapter 1 all codes except IRC and IECC, referenced standards administrative updates, and designated definitions)* *Administrative Code Committee*
International Fuel Gas Code *IFGC Committee*	*International Energy Conservation Code (see note 1)* *Commercial Energy Committee* *Residential Energy Committee*
International Mechanical Code *IMC Committee*	*International Existing Building Code* *IEBC Committee*
International Plumbing Code *IPC Committee*	*International Fire Code* *IFC Committee*
International Private Sewage Disposal Code *IPC Committee*	*International Green Construction Code Committees:* *IGCC—Energy/Water Committee (Chapters: 6 and 7)* *IGCC—General Committee (Chapters:2-5, 8-11 and Append)*
	International Performance Code (see note 2) *ICC Performance Code Committee*
	International Property Maintenance Code *IPMC/IZC Committee*
	International Wildland-Urban Interface Code *IFC Committee*
	International Zoning Code *IPMC/IZC Committee*
	International Residential Code Committees: *IRC-B (Chapters: 1-10 and App. E, F, G,H, J, K, L, M, O)* *IRC-M/P (Chapters: 12-33 and App. I, P)*
	International Swimming Pool and Spa Code *ISPSC Committee*

NOTE:
1. Residential Energy Committee is responsible for Chapter 11 of the IRC and the Residential Provisions of the IECC.
2. In anticipation of minimal code change activity, a ICC Performance Committee has not been appointed. Any changes will be considered by the IFC Committee.

GROUP A CODE DEVELOPMENT COMMITTEE RESPONSIBILITIES

Some sections of the International Codes have a letter designation in brackets in front of them. For instance, Section 301.1.4 of the IEBC has a [B] in front of it, meaning that this section is the responsibility of one of the IBC Code Development Committees (in this case, IBC-S).

Code change proposals submitted for such code sections that have a bracketed letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees will meet in different years, some proposals for a given code will be heard by a committee in a different year than the year in which the primary committee for this code meets.

Note that there are several code change proposals in the IBC-Structural hearing order that are changes to the International Existing Building Code (marked with prefix "EB"). These are proposed changes to sections of the existing building code that are the responsibility of the IBC-Structural Code Development Committee.
A complete summary of the Group A and Group B Code Development Committees' responsibilities can be view at the ICC Website: http://www.iccsafe.org/cs/codes/Documents/2012-13cycle/GroupA-B_CDC-Responsibilities.pdf.

ANALYSIS STATEMENTS

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

REFERENCE STANDARDS

Proposed changes that include the addition of a reference to a new standard (i.e. a standard that is not currently referenced in the I-Codes.) will include in the proposal the number, title and edition of the proposed standard. This identifies to all interested parties the precise document that is being proposed and which would be included in the referenced standards chapter of the code if the proposed change is approved. Section 3.6.3.1 of CP #28 now requires that a code change proposal will not be processed unless a consensus draft of the standard has been provided. Proponents of code changes which propose a new standard have been directed to forward copies of the standard to the Code Committee. An analysis statement will be posted on the ICC website providing information regarding standard content, such as enforceable language, references to proprietary products or services, and references to consensus procedure. The analysis statements for referenced standards will be posted on or before March 28th, 2012. This information will also be published and made available at the hearings.

REFERENCED STANDARDS UPDATES

Administrative updates of any standards already referenced in any of the I-Codes will be contained in a code change proposal for consideration by the Administrative Code Development Committee. The Administrative Code Development Committee is a Group B committee which will conduct hearings on the administrative provisions (Chapter 1 and certain definitions) of all I-Codes, and the referenced standards update. Therefore, this committee will conduct its code development hearing during the code development hearings in 2013.

It should be noted that, in accordance with Section 4.5.1 of CP #28 (see page xvi), standards promulgators will have until December 1, 2014 to finalize and publish any updates to standards in the administrative update. If the standard update is not finalized and published by December 1, 2014, the respective I-Codes will be revised to reference the previously listed year edition of the standard.

MODIFICATIONS

Those who are submitting a modification for consideration by the respective Code Development Committee are required to submit a Copyright Release in order to have their modifications considered (Section 3.3.4.5 of CP #28). It is preferred that such release be executed in advance – the form is at http://www.iccsafe.org/cs/codes/publicforms.htm. Copyright release forms will also be available at the hearings. Please note that an individual need only sign one copyright release for submittals of all code change proposals, modifications, and public comments in this code change cycle for which the individual might be responsible. **Please be sure to review Section 5.5.2 of CP #28 for the modification process.** The Chair of the respective code development committee rules a modification in or out of order. That ruling is final, with no challenge allowed. The proponent submitting a modification is required to supply 20 printed copies. The minimum font size must be 16 point.

Example:

Original code change proposal.

The original code change proposal requested the following change to Section 305.3 of one of our I-Codes: (Note that the example is fictional.)

G10-12
305.13

Proponent: John West representing self

Revise as follows:

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good and clean condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster~~,~~ ~~decayed wood~~ and other defective surface conditions shall be corrected. Surfaces of porous materials made of or containing organic materials, such as but not limited to wood, textiles, paint, cellulose insulation, and paper, including paper-faced gypsum board, that have visible signs of mold or mildew shall be removed and replaced or remediated in an approved manner.

Exception: Porous materials that do not contain organic materials, such as clean unpainted bricks and concrete.

Proposed modification:

A modification to the code change proposal is proposed:

1. To add “and sanitary” after “clean” in the first sentence.
2. To add “or water permeable” after “porous” in the third sentence.
3. Delete “in an approved manner.” in the last sentence.
4. Delete the proposed new exception.

The modification should read as follows. Note that the font style is Ariel, and the font size is 16 pt. The ~~cross out,~~ underline format is removed from the text of the original proposal and the requested revisions in the original proposal are made and shown as original text. The modification to the original proposal is shown with ~~cross out,~~ underline format applied to the changes proposed in the modification.

Example of proposed modification:

G10-12
305.13

Proponent: Sam Sumter representing self

Modify the proposal as follows:

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good, ~~and~~ clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster and other defective surface conditions shall be corrected. Surfaces of porous or water permeable materials made of or containing organic materials, such as but not limited to wood, textiles, paint, cellulose insulation, and paper, including paper-faced gypsum board, that have visible signs of mold or mildew shall be removed and replaced or remediated ~~in an approved manner~~.

> ~~**Exception:** Porous materials that do not contain organic materials, such as clean unpainted bricks and concrete.~~

Note: *The modification should be able to be shown on the overhead screen on a single page. Only show the pertinent part of the code change proposal that shows the intended revisions. The entire code change proposal need not be shown.*

CODE CORRELATION COMMITTEE

In every code change cycle, there are code change proposals that are strictly editorial. The Code Correlation Committee approves all proposals deemed editorial. A list of code correlation committee actions are shown at the end of this document (CCC-1).

ICC WEBSITE – WWW.ICCSAFE.ORG

This document is posted on the ICC Website, www.iccsafe.org. While great care has been exercised in the publication of this document, errata to proposed changes may occur. Errata, if any, will be identified in updates posted prior to the Code Development Hearings on the ICC website at http://www.iccsafe.org. Users are encouraged to periodically review the ICC Website for updates to the 2012/2013 Code Development Cycle-Group A (2012) Proposed Changes. Additionally, analysis statements for code changes which propose a new referenced standard will be updated to reflect the staff review of the standard for compliance with Section 3.6 of the Procedures.

PROPONENT CONTACT INFORMATION

For most of the code change proposals, an e-mail address for the proponent has been provided.

2012/2013 ICC CODE DEVELOPMENT SCHEDULE

STEP IN CODE DEVELOPMENT CYCLE	**DATE**	
	2012 – Group A Codes IBC, IFGC, IMC, IPC, IPSDC (See Notes)	**2013 – Group B Codes Admin, ICCPC, IEBC, IECC, IFC, IgCC, IPMC, ISPSC, IRC, IWUIC, IZC (See Notes)**
2012 EDITION OF I-CODES PUBLISHED	April 30, 2011	
DEADLINE FOR RECEIPT OF APPLICATIONS FOR ALL CODE COMMITTEES	June 1, 2011 (updated to July 1 for IECC and IRC – Energy; August 1 for IgCC and ISPSC)	
DEADLINE FOR RECEIPT OF CODE CHANGE PROPOSALS	January 3, 2012	January 3, 2013
WEB POSTING OF "PROPOSED CHANGES TO THE I-CODES"	March 12, 2012	March 11, 2013
DISTRIBUTION DATE OF "PROPOSED CHANGES TO THE I-CODES" (CD only)	April 2, 2012	April 1, 2013
CODE DEVELOPMENT HEARING (CDH)	April 29 – May 6, 2012 Sheraton Dallas Hotel Dallas, TX	April 21 – 28, 2013 Sheraton Dallas Hotel Dallas, TX
WEB POSTING OF "REPORT OF THE PUBLIC HEARING"	June 8, 2012	May 31, 2013
DISTRIBUTION DATE OF "REPORT OF THE PUBLIC HEARING" (CD only)	June 29, 2012	June 21, 2013
DEADLINE FOR RECEIPT OF PUBLIC COMMENTS	August 1, 2012	July 15, 2013
WEB POSTING OF PUBLIC COMMENTS "FINAL ACTION AGENDA"	September 10, 2012	August 28, 2013
DISTRIBUTION DATE OF PUBLIC COMMENTS "FINAL ACTION AGENDA" (CD only)	October 1, 2012	September 16, 2013
FINAL ACTION HEARING (FAH)	October 24 – 28, 2012 Oregon Convention Center Portland, OR	October 2 – 9, 2013 Atlantic City Convention Center Atlantic City, NJ
ANNUAL CONFERENCES	October 21 – 24, 2012 Oregon Convention Center Portland, OR	September 29 – October 2, 2013 Atlantic City Convention Center Atlantic City, NJ

Notes:

- Be sure to review the "Group A and Group B Code Development Committee Responsibilities" posted at www.iccsafe.org/responsibilities which identifies committee responsibilities which are different than Group A and Group B codes which may impact the applicable code change cycle and resulting code change deadline.
- The International Green Construction Code (IgCC) and International Swimming Pool and Spa Code (ISPSC) to undergo a full cycle of code development in 2011 resulting in 2012 editions published in March/2012
- Group B "Admin" includes code change proposals submitted to Chapter 1 of all the I-Codes except the ICCPC, IECC and IRC and the administrative update of referenced standards in the 2012 I-Codes
- Start 2015/2016 Code Development Cycle with Group A code change proposals due January 5, 2015

2012/2013 STAFF SECRETARIES

GROUP A (2012)

IBC-Fire Safety Chapters 7, 8, 9, 14, 26	IBC-General Chapters 1-6, 12, 13, 27-34	IBC-Means of Egress Chapters 10, 11	IBC-Structural Chapters 15-25
Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpaarlberg@iccsafe.org	Alan Carr ICC NW Resource Center 1-888-ICC-SAFE, ext 7601 FAX: 425/637-8939 acarr@iccsafe.org
IFGC	**IMC**	**IPC/IPSDC**	
Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	

GROUP B (2013)

ADMINISTRATIVE Chapter 1 All Codes Except IRC	IEBC	IECC-Commercial	IECC-Residential
Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpaarlberg@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dbowman@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dbowman@iccsafe.org
IFC	**IgCC-General**	**IgCC-Energy/Water**	**ICC PC**
Bill Rehr/ Beth Tubbs ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org btubbs@iccsafe.org	Allan Bilka ICC Chicago District Office 1-888-ICC-SAFE, ext 4326 FAX: 708/799-0320 abilka@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org
IPMC	**IRC-Building**	**IRC Mechanical**	**IRC Plumbing**
Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	Larry Franks/ Dave Bowman ICC Birmingham District Office 1-888-ICC-SAFE, ext 5279 FAX: 205/592-7001 lfranks@iccsafe.org dbowman@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org
ISPSC	**IWUIC**	**IZC**	
Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	Bill Rehr ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	

COMMITTEE A
ASSIGNMENT CROSSOVER LIST—WITHIN THE IBC

The 2012/2013 Staff Secretaries assignments on page x indicate which chapters of the International Building Code are generally within the responsibility of each IBC Code Committee. However, within each of these IBC Chapters are subjects that are most appropriately maintained by another IBC Code Committee. For example, the provisions of Section 403.5 deal with means of egress from high-rise buildings. Therefore, even though Chapter 4 is within the responsibility of the IBC – General Committee, this section would most appropriately be maintained by the IBC – Means of Egress Committee. The following table indicates responsibilities by IBC Code Committees other than the main committee for those chapters, for code changes submitted for the 2012 portion (Group A) of the 2012/2013 Cycle.

SECTION	CHAPTER MAINTAINED BY	SECTION MAINTAINED BY	CODE CHANGE PROPOSALS
403.5	IBC-General	IBC-Means of Egress	E4, E7
405.7.1	IBC-General	IBC-Means of Egress	E3
411.7	IBC-General	IBC-Means of Egress	E3
1508.1	IBC-Structural	IBC-Fire Safety	FS178
3401.2	IBC-General	IBC-Structural	S90
3406.1.3	IBC-General	IBC-Means of Egress	E4
3406.4	IBC-General	IBC-Means of Egress	E4
3411.8.4	IBC-General	IBC-Means of Egress	E4
3411.8.15	IBC-General	IBC-Means of Egress	E211

CP# 28-05 CODE DEVELOPMENT

Approved: 9/24/05
Revised: 10/29/11

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

1.0 Introduction

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

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

1.2.1 The timely evaluation and recognition of technological developments pertaining to construction regulations.

1.2.2 The open discussion of proposals by all parties desiring to participate.

1.2.3 The final determination of Code text by public officials actively engaged in the administration, formulation or enforcement of laws, ordinances, rules or regulations relating to the public health, safety and welfare and by honorary members.

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

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

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

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

1.6 Recording: Individuals requesting permission to record any meeting or hearing, or portion thereof, shall be required to provide the ICC with a release of responsibility disclaimer and shall acknowledge that ICC shall retain sole ownership of the recording, and that they have insurance coverage for liability and misuse of recording materials. Equipment and the process used to record shall, in the judgment of the ICC Secretariat, be conducted in a manner that is not disruptive to the meeting. The ICC shall not be responsible for equipment, personnel or any other provision necessary to accomplish the recording. An unedited copy of the recording shall be forwarded to ICC within 30 days of the meeting. Recordings shall not otherwise be copied, reproduced or distributed in any manner. Recordings shall be returned to

ICC or destroyed upon the request of ICC.

2.0 Code Development Cycle

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

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

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

2.4 Emergency Procedures:

2.4.1 Scope: Emergency actions are limited to those issues representing an immediate threat to health and safety that warrant a more timely response than allowed by the Code Development Process schedule.

2.4.2 Initial Request: A request for an emergency action shall be based upon perceived threats to health and safety and shall be reviewed by the ICC Codes and Standards Council for referral to the Board of Directors for action with their analysis and recommendation.

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

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

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

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

3.0 Submittal of Code Change Proposals

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

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

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

3.3.1 Proponent: Each code change proposal shall include the name, title, mailing address, telephone number, and email address of the proponent. Email addresses shall be published with the code change proposals unless the proponent otherwise requests on the submittal form.

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

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

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

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

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

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

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

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

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

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

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

3.3.4.5 The proposed text shall be in mandatory terms.

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

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

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

3.3.5.3 **Substantiation:** The proponent shall substantiate the proposed code change based on technical information and substantiation. Substantiation provided which is reviewed in accordance with Section 4.2 and determined as not germane to the technical issues addressed in the proposed code change may be identified as such. The proponent shall be notified that the proposal is considered an incomplete proposal in accordance with Section 4.3 and the proposal shall be held until the deficiencies are corrected. The proponent shall have the right to appeal this action in accordance with the policy of the ICC Board. The burden of providing substantiating material lies with the proponent of the code change proposal. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

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

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

3.3.5.6 **Cost Impact:** The proponent shall indicate one of the following regarding the cost impact of the code change proposal: 1) the code change proposal will increase the cost of construction; or 2) the code change proposal will not increase the cost of construction. The proponent should submit information that supports their claim. Any information submitted will be considered by the code development committee. This information will be included in the bibliography of the published code change proposal.

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

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

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

3.6.1 Code References:

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

3.6.2 Standard Content:

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

3.6.3 Standard Promulgation:

3.6.3.1 Code change proposals with corresponding changes to the code text which include a reference to a proposed new standard or a proposed update of an existing referenced shall comply with this section. The standard shall be completed and readily available prior to Final Action Consideration based on the cycle of code development which includes the proposed code change proposal. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If a new standard is not submitted in at least draft form, the code change shall be considered incomplete and shall not be processed. Updating of standards without corresponding code text changes shall be accomplished administratively in accordance with Section 4.5.

3.6.3.2 The standard shall be developed and maintained through a consensus process such as ASTM or ANSI.

4.0 Processing of Proposals

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

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

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

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

4.5 Updating Standards:

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

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

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

5.0 Public Hearing

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

5.2 Committee: The Code Development Committees shall be appointed by the Board of Directors.

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

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

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

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

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

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

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

5.4.2 Open Meetings: Public hearings of the Code Development Committees are open meetings. Any interested person may attend and participate in the Floor Discussion and Assembly Consideration portions of the hearing. Only eligible voters (see Section 5.7.4) are permitted to vote on Assembly Considerations. Only Code Development Committee members may participate in the Committee Action portion of the hearings (see Section 5.6). Participants shall not advocate a position on specific code changes with Committee Members other than through the methods provided in this policy.

5.4.3 Presentation of Material at the Public Hearing: Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.4.4 and other material submitted in response to a code change proposal shall be located in a designated area in the hearing room and shall not be distributed to the code development committee at the public hearing.

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

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

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

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

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

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

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

5.5.1 Discussion Order:

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

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

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

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

1. is not legible, unless not required to be written in accordance with Section 5.5.2.1; or

2. changes the scope of the original proposal; or
3. is not readily understood to allow a proper assessment of its impact on the original proposal or the code.

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

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

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

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

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

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

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

5.7 **Assembly Consideration:** At the conclusion of the committee's action on a code change proposal and before the next code change proposal is called to the floor, the Moderator shall ask for a motion from the public hearing attendees who may object to the committee's action. If a motion in accordance with Section 5.7.1 is not brought forward on the committee's action, the results of the public hearing shall be established by the committee's action. If a motion in accordance with Section 5.7.1 is brought forward and is sustained in accordance with Section 5.7.3, both the committee's action and the assemblies' action shall be reported as the results of the public hearing.

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

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

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

5.7.3 **Assembly Action:** A successful assembly action shall be a majority vote of the votes cast by eligible voters (See 5.7.4).

5.7.4 **Eligible Voters:** All members of ICC in attendance at the public hearing shall be eligible to vote on floor motions. Each member is entitled to one vote, except that each Governmental Member Voting Representative in attendance may vote on behalf of its Governmental Member. Code Development Committee members shall be eligible to vote on floor motions. Application, whether new or updated, for ICC membership must be received by the Code Council ten days prior to the commencement of the first day of the public hearing.

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

6.0 Public Comments

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

6.1.1 Consideration of items for which a public comment has been submitted; and

6.1.2 Consideration of items which received a successful assembly action at the public hearing.

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

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

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

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

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

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

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

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

6.4.5 Supporting Information: The public comment shall include in a statement containing a reason and justification for the desired final action on the code change proposal. Reasons and justification which are reviewed in accordance with Section 6.4 and determined as not germane to the technical issues addressed in the code change proposal or committee action may be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. The public commenter shall have the right to appeal this action in accordance with the policy of the ICC Board. A bibliography of any substantiating material submitted with a public comment shall be published with the public comment and the substantiating material shall be made available at the Final Action Hearing. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

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

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

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

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

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

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

7.0 Final Action Consideration

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

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

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

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

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

7.3.3 **Presentation of Material at the Public Hearing:** Information to be provided at the hearing shall be limited to verbal presentations. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 6.4.4 and other material submitted in response to a code change proposal or public comment shall be located in a designated area in the hearing room.

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

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

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

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

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

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

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

7.3.8.2 **Initial Motion:** The Code Development Committee action shall be the initial motion considered.

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

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

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

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

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

7.4 Eligible voters: ICC Governmental Member Representatives and Honorary Members in attendance at the Final Action Hearing shall have one vote per eligible attendee on all International Codes. Applications for Governmental Membership must be received by the ICC by April 1st of the applicable year in order for its designated representatives to be eligible to vote at the Final Action Hearing. Applications, whether new or updated, for governmental member voting representative status must be received by the Code Council thirty (30) days prior to the commencement of the first day of the Final Action Hearing in order for any designated representative to be eligible to vote. An individual designated as a Governmental Member Voting Representative shall provide sufficient information to establish eligibility as defined in the ICC Bylaws. The Executive Committee of the ICC Board, in its discretion, shall have the authority to address questions related to eligibility. Decisions of the Executive Committee shall be final and not appealable pursuant to CP 1, other than claims of fraud or misrepresentation, supported by reasonably credible evidence, that were material to the outcome of the Final Action Hearing.

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

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

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

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

8.0 Appeals

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

2012 ICC CODE DEVELOPMENT CYCLE
CROSS INDEX OF PROPOSED CODE CHANGES

Some of the proposed code changes include sections that are outside of the scope of the chapters or the code listed in the table of 2012/2013 Staff Secretaries on page x. This is done in order to facilitate coordination among the International Codes which is one of the fundamental principles of the International Codes.

Listed in this cross index are proposed code changes that include sections of codes or codes other than those listed on page ix. For example, IBC Section 703.2.3 is proposed for revision in code change S70-12, which is to be heard by the IBC Structural Committee. This section of the IBC is typically the responsibility of the IBC Fire Safety Committee as listed in the table of 2012/2013 Staff Secretaries. It is therefore identified in this cross index. Another example is Section 905.4 of the International Fire Code. The International Fire Code is normally maintained by the IFC Committee, but Section 905.4 will be considered for revision in proposed code change E4-12 which will be placed on the IBC Means of Egress Committee agenda. In some instances, there are other subsections that are revised by an identified code change that is not included in the cross index. For example, numerous sections in Chapter 10 of the International Fire Code would be revised by the proposed changes to Chapter 10 of the IBC. This was done to keep the cross index brief enough for easy reference.

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

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

PREFIX	**PROPOSED CHANGE GROUP (see monograph table of contents for location)**
ADM	Administrative
E	International Building Code - Means of Egress
EB	International Existing Building Code
CE	International Energy Conservation Code – Commercial
RE	International Energy Conservation Code – Energy
F	International Fire Code
FG	International Fuel Gas Code
FS	International Building Code - Fire Safety
G	International Building Code – General
GEW	International Green Construction Code – Energy/Water
GG	International Green Construction Code – General
M	International Mechanical Code
PC	ICC Performance Code
P	International Plumbing Code
PSD	International Private Sewage Disposal Code
PM	International Property Maintenance Code
RE	International Residential Code - Building
RM	International Residential Code - Mechanical
RP	International Residential Code - Plumbing
S	International Building Code – Structural
SP	International Swimming Pool and Spa Code
WUIC	International Wildland-Urban Interface Code
Z	International Zoning Code

International Building Code		907.2.10.1	G71
		907.2.13.2	E4
101.4	G201	907.5.2.2	E4
101.4.7 (New)	G201	909.4.6	G32 Part II
104.11.3 (New)	FS73	909.9	S70
107.2.6	G198	909.18	S113, S117
110.3.5	S304	909.20	E4, E5
116.5	G201	909.21.7	S113
202	P27, P29	911.1.5	E4
403.5	E4, E7	1003.2	G62
404.6	FS41, FS99	Table 1004.1.2	G193
405.7.1	E3	1004.3	S90
410.6.1	E3	1005.7.2	G73
411.7	E3	1007.1	G237
414.7.2	E3	1007.6	G57
505.2.3	E7	1009.3	FS51, FS99
505.3	E101	1015.2.1	G85
703.2.3	S70	1015.4	G57
706.1	G103	1015.5	G57
707.5.1	E7	Table 1016.2	G32 Part I, G87
707.6	E4	1018.1	G31 Part I
707.7.1	E4	Table 1018.1	G32 Part I
709.5	G31 Part I	Table 1018.2	G32 part I
710.8	G32 Part I	1018.4	G32 Part I
711.4	E7	Table 1021.2(2)	G57
712.1.8	G32 Part I, G54, E7	1022.7	G85
712.1.12	E7	1027.1	G175
713.1	E4, E7	1203.1	M36, M37, M38, M39
713.14.1	G32 Part I, E110	1205.4	E4
713.14.1.2 (new)	G174 Part III	1207.1	E4
Table 716.5	G51, E4	1403.7	S102, S103
716.5.3	E3	1404.13 (New)	S309
717.5.5	G32 Part I	1507.16	G98
718.2.4	E4	1507.16.1	G98
722.5	S238	1508.1	FS178
Table 803.9	E4	1609.1.2	G199
901.5	S90	1808.7.3	G193
903.2.6	G31 Part II, G32 Part II	2103.15(New)	FS177
903.2.8	G31 Part II	2110.1.1	E4
903.2.8.1	G31 Part II	2303.1.4 (new)	G142 Part II
903.2.8.2 (new)	G31 Part II	2308.12.7	E4
903.2.8.2	G31 Part II	2405.3	G199
903.2.8.3 (new)	G31 Part II	2406.4	G193
903.3.1.3	G31 Part II	2406.4.5	G193
903.3.2	G32 Part II	2406.4.6	E4
905.3.3	E4	2406.4.7	E4
905.4	E4	2607.4	G199
906.2	G71	2609.4	G193, G199
Table 906.3(1)	G71	Table 2902.1.2 (New)	P27
Table 906.3(2)	G71	2902.2	P34
907.2.6	G32 Part II, G71	2902.3	P35
907.2.6.1	G31 Part II	2902.3.1	P36
907.2.6.4 (new)	G32 Part II	2902.3.5	P37

International Building Code (continued)

2902.4.1	P39
2902.6 (New)	P30
Table 2902.1.2 (New)	P27
3007.7	E110
3007.9	FS138
3008.7	E110
3008.9	FS138
3111.1	S3
3306.8	S90
3311.1	E4
3401.2	S90
3406.1.3	E4
3406.4	E4
3411.8.4	E4
3411.8.15	E211

International Fire Code

202	G1, G2, G11, G13, G31 Part I, G32 Part I, G43, G70
Definition of Group A	G27
Definition of Group B	G28, G29, G30
Definition of Group E	G27
Definition of Group I	G31 Part I, G32 Part I, G33, G34, G35, G36, G37
Definition of Group R	G31 Part I, G34, G36, G38, G39, G40, G41
Definition of Group S	G42
508.1.5	E4
604.2.16 (new)	G77
903.2.6	G31 Part II, G32 Part II
903.2.8	G31 Part II
903.2.8.1	G31 Part II
903.2.8.2 (new)	G31 Part II
903.2.8.2	G31 Part II
905.3.3	E4
905.4	E4
903.2.8.3 (new)	G31 Part II
903.3.1.3	G31 Part II
903.3.2	G32 Part II
906.2	G71
Table 906.3(1)	G71
Table 906.3(2)	G71
907.2.6	G32 Part II, G71
907.2.6.1	G31 Part II
907.2.6.4 (new)	G32 Part II
907.2.10.1	G71
907.2.13.2	E4
907.5.2.2	E4
909.4.6	G32 Part II
1003.2	G62
Table 1004.1.2	G193
1005.7.2	G73
1007.1	G237
1007.6	G57
1015.2.1	G85
1015.4	G57
1015.5	G57
Table 1016.2	G32 Part I, G87
1018.1	G31 Part I
Table 1018.1	G32 Part I
Table 1018.2	G32 part I
1018.4	G32 Part I
Table 1021.2(2)	G57
1022.7	G85
1027.1	G175
1104.6.1	E4
1104.9	E4
1104.10	E4
1104.12	E4
1104.16	E4
1104.20	E4
1104.21	E4
1104.23	E4
3313.1	E4
5005.4.4	E3
5704.2.9.4	E4
5706.5.1.12	E4

INTERNATIONAL PLUMBING CODE

202	G8, G193 Part IV, P3(HEARD BY IBC-S)
309.2	P20 (HEARD BY IBC-S)
403.3.3	G71
403.3.4	G71
403.5	G71
423.1	G193 Part IV
612.1	G193 Part IV
801.1	G193 Part IV
802.1.4	G193 Part IV

INTERNATIONAL MECHANICAL CODE

202	G8
304.11	E108
306.5.1	E4
403.2.1	G193 Part II
Table 403.3	G193 Part II
601.3	E228, E229
901.5	FG3

INTERNATIONAL MECHANICAL CODE (continued)	
901.6	FG3
926.2	FG38
926.3	FG38
1107.2	E4
1401.1	G193 Part II
INTERNATIONAL FUEL GAS CODE	
202	G8
306.5.1	E4
614.6	M71
Section 617	G193 Part III
617.1	G193 Part III
629.1	M169
INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE	
202	G8, P228 (HEARD BY IBC-S)
401.3.2	G193 Part IV
Table 406.1	G193 Part IV
Table 604.1(2)	G193 Part IV
Table 802.7.2	G193 Part IV
Table 802.8	G193 Part IV
INTERNATIONAL EXISTING BUILDING CODE	
Chapters 3 through 14	G205
202	G23, G24
402.1	G210
402.4	G211
403.1	G210, G212
403.3 (new)	G213 Part I
403.3.1 (new)	G213 Part I
403.3.2 (new)	G213 Part I
403.3.3 (new)	G213 Part I
403.4	G211
403.4.1(new)	G214
403.4.5 (new)	G215, G216, G217
403.5 (new)	G218
403.7 (new)	G219
403.7.1(new)	G219
403.7.2(new)	G219
403.7.3(new)	G219
404.1	G212
404.2 (new)	G220
404.2	G221 Part I
404.2.1	G211
404.2.2	G222
404.3	G223
404.3.1	G224 Part I
404.4	G222
404.2.3	G211, G212
404.5	G212
406.1	G225, G226
410.5.1(new)	G235
410.6	G235, G236, G237
410.7	G237, G238, G240
410.7.1	G240
410.8	G239, E211
410.8 (new)	G237
410.8.1 (new)	G237
410.8.4	G241
410.8.6	G242
410.8.9	G235, G236
410.8.11	G243
606.2.2	G221 Part II
606.2.3.1	G224 Part II
907.2	G213 Part II
907.2.1	G213 Part II
907.2.2	G213 Part II
1401.2	G244
1401.2.5	G245
1401.3.2	G246
Table 1401.3.2(new)	G246
1401.6	G244
1401.6.1	G101
1401.6.1.1	G101
1401.6.2	G101, G244
1401.6.2.1	G101
1401.6.4	G244
Table 1401.6.4	G244
1401.6.5	G244
Table 1401.6.5	G57, G244
1401.6.6	G51
1401.6.7	G244
1401.6.8	G244
Table 1401.6.8	G244
1401.6.8.1	G244
1401.6.9	G244
Table 1401.6.9	G244
1401.6.10	G244
Table 1401.6.10	G244
1401.6.11	G244
Table 1401.6.11	G244
1401.6.12	G244
Table 1401.6.12	G244
1401.6.12.1	G244
1401.6.16	G244
1401.6.16.1	G244
1401.6.17	G244
Table 1401.6.17	G244
1401.6.18	G244
Table 1401.6.18	G244
1401.6.20 (new)	G244
Table 1401.6.20 (new)	G244
1401.6.21 (new)	G244

INTERNATIONAL EXISTING BUILDING CODE (continued)	
Table 1401.6.21.1 (new)	G244
1401.6.21.1.1(new)	G244
1401.6.21.2(new)	G244
Table 1401.6.21.2(new)	G244
1401.6.21.2.1(new)	G244
1401.6.21.3(new)	G244
Table 1401.6.21.3	G244
1401.6.21.3.1(new)	G244
Table 1401.7	G244
1401.8	G244
Table 1401.8	G244

2012 GROUP A CODE DEVELOPMENT HEARING SCHEDULE
April 29 – May 8, 2012
Sheraton Dallas Hotel

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

Please note that the hearing start on Sunday, April 29th has been revised from 10:00 am to 12:00 pm from the originally posted version. Prior to the hearings starting at noon on Sunday, the following is also scheduled:

- Membership Councils: 8:00 am – 10:00 am
- CDP ACCESS update (Expanding code development participation): 10:15 am – 11:15 am

For more information on the scheduling of these two activities, be sure to check the link to the Member Committees page on the ICC Website: http://www.iccsafe.org/membership/pages/committees.aspx

	Sunday April 29	Monday April 30	Tuesday May 1	Wednesday May 2	Thursday May 3
TRACK 1	Start 12 pm IBC - FS End 9 pm	Start 8 am IBC - FS End 9 pm	Start 8 am IBC - FS IBC – G (Start no earlier than 8 am) End 9 pm	Start 8 am IBC - G End 9 pm	Start 8 am IBC – G IBC - E (Start no earlier than 8 am) End 9 pm
TRACK 2	Start 12 pm IFGC IPC/IPSDC End 9 pm	Start 8 am IPC/IPSDC End 9 pm	Start 8 am IPC/IPSDC IMC (Start no earlier than 8 am) End 9 pm	Start 8 am IMC End 9 pm	Start 8 am IMC IEBC – S (Start no earlier than 8 am) IBC – S End 9 pm

	Friday May 4	Saturday May 5	Sunday May 6	Monday May 7	Tuesday May 8
TRACK 1	Start 8 am IBC - E End 9 pm	Start 8 am IBC – E End 9 pm	Start 8 am IBC – E Finish 12 pm		
TRACK 2	Start 8 am IBC - S End 9 pm	Start 8 am IBC - S End 9 pm	Start 8 am IBC - S End 9 pm	Start 8 am IBC - S End 9 pm	Start 8 am IBC – S Finish 12 pm

Notes:
1. IEBC – S: Structural provisions in the IEBC to be heard by the IBC – Structural Code Committee.
2. Hearing times may be modified at the discretion of the Chairman.
3. Breaks will be announced. Lunch and dinner breaks planned for each track. There will not be a lunch break on Sunday, April 29th.

2012 PROPOSED CHANGES TO THE INTERNATIONAL CODES

2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

FIRE SAFETY CODE COMMITTEE

Kenneth E. Bush - Chair
Rep: National Association of State Fire Marshals
Senior Fire Protection Engineer
Maryland State Fire Marshal's Office
Easton, MD

Lorin Neyer – Vice Chair
Regional Compliance Officer
State of California – Office of Statewide Health, Planning & Development
Manteca, CA

Gene Boecker, AIA
Senior Project Consultant
Code Consultants, Inc.
Saint Louis, MO

Matthew Dobson
Rep: National Association of Home Builders
Director
Vinyl Siding Institute
Burlington, NC

Douglas H. Evans, PE
Fire Protection Engineer
Clark County Department of Development Services-Building Division
Las Vegas, NV

Wayne G. Hamilton
Rep: International Association of Fire Chiefs
Fire Marshal
City of Asheville Fire Department
Asheville, NC

Stephan Kiefer
Chief Building Official
City of Livermore
Livermore, CA

Bill McHugh
Executive Director
Firestop Contractors International Association
Hillside, IL

Bob D. Morgan, PE, CPCU
Senior Fire Protection Engineer
Fort Worth Fire Department
Fort Worth, TX

Timothy Pate, CBO
Acting Chief Building Official
City & County of Broomfield Building Division
Broomfield, CO

Michael Pokorny, PE
Fire Protection Engineer
Montgomery County Department of Permitting Services
Rockville, MD

Michael Shannon, PE, CBO
Development Services Engineer
City of San Antonio, Development Svcs. Dept.
San Antonio, TX

David P. Tyree, PE, CBO
Director of Codes and Standards
Building Owners and Managers Association
Washington, DC

Michael E. Whalen
Construction Official
New Jersey Department of Community Affairs
Trenton, NJ

Terry Vosler
Senior Inspector
Bureau Veritas North America, Power and Utilities Division
Henderson, NV

Staff Secretariat
Ed Wirtschoreck, LA
Manager, Standards
International Code Council
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

FIRE SAFETY

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

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

    - G6-12
    - G11-12
    - G18-12
- FS1-12
- FS2-12
- FS3-12
- FS4-12
- FS5-12
- FS6-12
- FS7-12
- FS8-12
- FS9-12
- FS10-12
- FS11-12
- FS12-12
- FS13-12
- FS14-12
- FS15-12
- FS16-12
- FS17-12
- FS18-12
- FS19-12
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- FS51-12
- FS52-12
- FS53-12
- FS54-12
- FS55-12
- FS56-12
- FS57-12
- FS58-12, Part I
- FS58-12, Part II
- FS58-12, Part III
- FS58-12, Part IV
- FS58-12, Part V
- FS59-12
    - FS135-12
    - FS136-12
    - FS137-12
    - FS139-12
    - FS142-12
- FS60-12
- FS61-12
- FS62-12
- FS63-12
- FS64-12
- FS65-12
    - FS68-12
- FS66-12
- FS67-12
- FS69-12
- FS70-12
- FS71-12
    - G174-12, Part III
- FS72-12
- FS73-12
- FS74-12
- FS75-12
- FS76-12
    - G14-12
    - G15-12 `
- FS77-12
- FS78-12
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- FS90-12
- FS91-12
- FS92-12
- FS93-12
- FS94-12
- FS95-12
- FS96-12
- FS97-12

FS98-12
FS99-12, Part I
FS99-12, Part II
FS99-12, Part III
FS99-12, Part IV
FS99-12, Part V
FS100-12
FS101-12
FS102-12, Part I
FS102-12, Part II
FS103-12
  FS109-12
  M88-12
  M91-12
  G5-12
FS104-12
FS105-12
FS106-12
FS107-12
FS108-12
FS110-12
FS111-12
FS112-12
FS113-12
FS114-12
FS115-12
FS116-12
FS117-12
FS118-12
FS119-12
FS120-12
FS121-12
FS122-12
FS123-12
FS124-12
FS125-12
FS126-12
FS127-12
FS128-12
FS129-12
FS130-12
  S315-12, Part II
  S316-12, Part II
FS131-12
FS132-12
FS133-12
FS134-12
FS140-12
FS141-12
FS143-12
FS144-12
FS145-12
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FS177-11
FS178-12
FS179-12
FS180-12
FS181-12
FS182-12
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FS186-12
FS187-12
FS188-12
FS189-12
FS190-12
FS191-12
FS196-12
FS197-12
FS199-12
FS200-12

FS1 – 12
703.2

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

703.2 Fire-resistance ratings. The fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263 or in accordance with Section 703.3. The fire-resistance rating of penetrations and fire-resistant joint systems shall be determined in accordance Sections 714 and 715 respectively. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. ~~Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required fire-resistance rating.~~

> **Exception**: In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 or UL 263 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119 or UL 263, the fire exposure time period, water pressure and application duration criteria for the hose stream test of ASTM E 119 or UL 263 shall be based upon the fire-resistance rating determined in accordance with this exception.

Reason: Section 703.2 currently covers four distinct concepts that are jumbled together in one section, which is confusing for the code user.

One of these concepts requires materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies to not reduce the required fire-resistance rating. Requirements covering joints and penetrations in sections 715 and 714, respectively, already address this concern. This proposal replaces this sentence with a new second sentence. The user is guided to Sections 714 and 715 for integrity of penetration firestops and joint systems.

Cost Impact: None

FS1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.2 #2-FS-EUGENE

FS2 – 12

703.2 (New), 703.3, 3102.3.1

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

~~**703.2 Fire-resistance ratings.** The *fire-resistance rating* of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the *building official* to show that the required *fire-resistance rating* is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required *fire-resistance rating*.~~

> ~~**Exception:** In determining the *fire-resistance rating* of exterior bearing walls, compliance with the ASTM E 119 or UL 263 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required *fire-resistance rating* of an exterior nonbearing wall with the same *fire separation distance*, and in a building of the same group. When the *fire-resistance rating* determined in accordance with this exception exceeds the *fire-resistance rating* determined in accordance with ASTM E 119 or UL 263, the fire exposure time period, water pressure and application duration criteria for the hose stream test of ASTM E 119 or UL 263 shall be based upon the *fire-resistance rating* determined in accordance with this exception.~~

~~**703.3 Alternative methods for determining fire resistance.**~~ **703.2 Fire-resistance ratings.** ~~The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119 or UL 263.~~ The fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263. The required fire resistance of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in sources.
2. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119 or UL 263.
5. Alternative protection methods as allowed by Section 104.11.

(Sections 703.2.1 through 703.2.3 to remain unchanged)

(Renumber subsequent sections)

Reason: This proposal is intended to make the Section 703 requirements more user friendly. This proposal simply moves the requirements for determining fire resistance from section 703 to a more logical location in section 703.2. The resulting section now includes both the standards used to establish fire resistance ratings, and acceptable methods for establishing these ratings. It makes no changes to the five options in section 703.3, but does delete some duplicative wording.

The code currently indicates that Section 703.3 covers alternate methods for determining fire resistance. That is not really the case, what it really identifies are the acceptable methods for determining fire resistance, which are based on testing or determining equivalence to ASTM E119 and UL 263.

It is not the intent of this proposal to delete the remaining requirements in Section 703.2, but this proposal, as shown, assumes they have been relocated to other sections by our other proposals to Section 703.

Cost Impact: None

FS2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.2 #4-FS-EUGENE

FS3 – 12
703.2.3

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

703.2.3 Restrained classification. Fire-resistance-rated assemblies tested under ASTM E 119 or UL 263 shall not be considered to be restrained unless evidence satisfactory to the *building official* is furnished by the *registered design professional* showing that the construction qualifies for a restrained classification in accordance with ASTM E119 or UL 263. <u>Where an assembly is deemed to be restrained, the rating of beams shall also have a restrained beam classification in accordance with ASTM E 119 or UL 263. Otherwise, fire-resistance rated assemblies shall be considered unrestrained.</u> Restrained construction shall be identified on the plans.

Reason: The purpose of this proposal is to clarify that if an assembly is not considered to be restrained by the building official, it must be treated as an unrestrained assembly. A restrained classification yields higher fire-resistance ratings than unrestrained; therefore, the code takes the conservative approach by defaulting to the lesser rating by assuming the in-place conditions to be unrestrained unless structural documentation is provided that supports a restrained condition.

Because even restrained assembly ratings do not include restrained beams, the criteria for the beams used in restrained assemblies needs to comply with the restrained beam designs tested in order to comply with Table 601 of the IBC. The conditions of acceptance in ASTM E119 and ANSI/UL 263 provide criteria for Restrained Beam Ratings and Unrestrained Beam Ratings. A greater thickness of protection material is typically required for the Unrestrained Beam Rating as compared to the protection material thickness required for the Restrained Beam Rating based on the differences in the rating criteria. Accordingly, Unrestrained Beam Ratings may be used for beams designed for either restrained or unrestrained conditions. Restrained Beam Ratings may be used for beams designed for restrained conditions.

Floor-ceiling and roof-ceiling assemblies include fire-resistance ratings for use in both restrained or unrestrained conditions. It is up to the designer and Authority Having Jurisdiction to determine if an assembly is being used in a restrained or unrestrained application, as required by the IBC. Because of their more onerous criteria, Unrestrained Assembly Ratings may be used for floors and roofs designed for either restrained or unrestrained conditions.

Cost Impact: This proposal should not increase the cost of construction.

FS3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.2.3-FS-CRIMI

FS4 – 12
703.2.3

Proponent: Jerry R. Tepe, FAIA, JRT•AIA ARCHITECT representing The American Institute of Architects

Revise as follows:

703.2.3 Restrained classification. Fire-resistance-rated assemblies tested under ASTM E 119 or UL 263 shall not be considered to be restrained unless evidence satisfactory to the *building official* is furnished by the *registered design professional* showing that the construction qualifies for a restrained classification in accordance with ASTM E 119 or UL 263. Restrained construction shall be identified on the ~~plans~~ *construction documents*.

Reason: Revises the undefined term "plans" to the preferred and defined language of "construction documents." There is no technical change proposed.

Cost Impact: None

FS4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.2.3-FS-TEPE

FS5 – 12
703.2.4 (New)

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Add new text as follows:

703.2.4 Load-bearing wall assemblies. Fire-resistance-rated wall assemblies tested under ASTM E 119 or UL 263 shall not be considered to be load-bearing unless evidence satisfactory to the *building official* is furnished by the *registered design professional* showing that the construction qualifies as a load bearing element in accordance with ASTM E 119 or UL 263. The load-bearing fire-resistance-rated wall construction shall be identified on the plans.

Reason: Many times designers will submit wall assemblies to me fire resistance requirements in the IBC without considering whether the assemblies were tested and passed ASTM E119 or UL 263 requirements as load-bearing. This proposal places this requirement in the code to make the code user aware of this important criterion for fire rated wall assemblies.

Cost Impact: This change should not increase the cost of construction.

FS5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.2.4 (NEW)-FS-THOMPSON

FS6 – 12
703.3

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

703.3 Alternative methods for determining fire resistance. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119 or UL 263. The required fire resistance of a building element, component or assembly shall be ~~permitted to be~~ established by ~~any~~ <u>one</u> of the following methods ~~or procedures~~:

1. Fire-resistance designs <u>tested by an *approved agency*</u> ~~documented in sources~~.
2. Prescriptive designs <u>in accordance with</u> ~~of fire-resistance-rated building elements, components or assemblies as prescribed in~~ Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119 or UL 263.
5. Alternative protection methods as allowed by Section 104.11.

Reason: This proposal simplifies two of the options for establishing fire resistance. Concerning item 1, “Fire resistance designs in sources” could cover anything from a design from the UL Fire Resistance Directory to a sketch on a cocktail napkin. The intent appears to be designs tested to ASTM E119 or UL 263 by an approved agency, a defined term. The actual source of the design, whether in a publication or online, is irrelevant. The revision to item 2 is editorial only.

Cost Impact: None

FS6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.3 #1-FS-EUGENE

FS7 – 12
703.3, 722.6.2.4

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

703.3 Alternative methods for determining fire resistance. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119 or UL 263. The required fire resistance of a building element, component or assembly shall be established by any of the following methods or procedures:

1. Fire-resistance designs documented in sources.
2. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119 or UL 263.
5. ~~Alternative protection methods as allowed by Section 104.11.~~

722.6.2.4 Floors and roofs. In the case of a floor or roof, the standard test provides only for testing for fire exposure from below. ~~Except as noted in Section 703.3, Item 5, floor~~ Floor or roof assemblies of wood framing shall have an upper membrane consisting of a subfloor and finished floor conforming to Table 722.6.2(4) or any other membrane that has a contribution to fire resistance of at least 15 minutes in Table 722.6.2(1).

Reason: There is no need to make a specific reference to using alternate materials and methods in this section for two reasons. First, it is always an option that can be pursued. Second, that section provides no guidance whatsoever to the code users on how to determine an equivalent fire resistance rating. This section already includes options for using calculations or an engineering analysis for determining fire resistance. Section 703.3, item 5 does not appear to be a correct reference, since it includes no substantive requirements, but merely points to the section 104.11 alternate materials and methods provisions of the code. We could not identify a more appropriate section reference, so recommend this one be deleted with no substitution.

Cost Impact: None

FS7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.3 #2-FS-EUGENE AND 722.6.2.4-FS-EUGENE

FS8 – 12
703.4

Proponent: Joe Pierce, Dallas Fire Department, TX, representing the ICC Fire Code Action Committee

Delete without substitution:

~~**703.4 Automatic sprinklers.** Under the prescriptive fire-resistance requirements of the International Building Code, the fire-resistance rating of a building element, component or assembly shall be established without the use of automatic sprinklers or any other fire suppression system being incorporated as part of the assembly tested in accordance with the fire exposure, procedures, and acceptance criteria specified in ASTM E 119 or UL 263. However, this section shall not prohibit or limit the duties and powers of the building official allowed by Sections 104.10 and 104.11.~~

Reason: IBC Section 703.3 currently addresses alternative methods for determining fire resistance. Section 703.3 allows:

1. Prescriptive design according to Section 721
2. Engineering analysis based on ASTM E119 and UL 263 fire tests and reports
3. Alternative methods and materials according to Section 104.10

Section 703.4 specifies that sprinklers cannot be used as part of analyzing a fire-resistance requirement, but then it goes on to say that if you qualify the design under Section 104.10 as an alternate method then it is acceptable. Essentially, this section says "sprinklers cannot be included as providing any protection, but if you approve it under Section 104.10, then sprinklers can count."

In essence, this section provides no guidance for either the designer or code official, and it is nearly redundant of the provisions found in Section 703.3.

This proposal will delete this section since it is not needed in the code.

Cost Impact: The code change will not increase the cost of construction.

FS8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.4-FS-PIERCE-FCAC

FS9 – 12
703.5

Proponent: Stephen V. Skalko, representing Portland Cement Association

Revise as follows:

703.5 Noncombustibility tests. The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2 602.3 and 602.4 in Type I, II, III and IV construction. The term "noncombustible" does not apply to the flame spread characteristics of *interior finish* or *trim* materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

<u>**Exceptions:**</u>

1. <u>Concrete and Concrete Products. Concrete and concrete products produced using aggregates conforming to ASTM C33, ASTM C330, ASTM C331 or ASTM C332 shall be considered non-combustible.</u>
2. <u>Clay Masonry. Clay masonry products permitted in TMS 402/ACI 530/ ASCE 5 shall be considered non-combustible.</u>
3. <u>Glass Masonry. Glass masonry products permitted in TMS 402/ACI 530/ ASCE 5 shall be considered non-combustible.</u>
4. <u>Steel. Steel conforming to the provisions in Chapter 22 of this code.</u>

Add new standard to Chapter 35 as follows:

ASTM
<u>C332-09 Standard Specification for Lightweight Aggregates for Insulating Concrete</u>

Reason: In efforts to be green and sustainable traditional materials like concrete and concrete products are being made using a variety of substitute materials in the process. In addition, there is increased interest in disposing of materials within these newer types of traditional materials. One of the results of this movement is traditional materials (concrete, concrete masonry, clay masonry, glass, etc.) that have been considered non-combustible may no longer be non-combustible. This proposal establishes that traditional non-combustible materials conforming to the appropriate standards referenced in the International Building Code are considered non-combustible.

Cost Impact: This proposal will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASTM C332 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.5-FS-SKALKO

FS10 – 12
703.5.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

703.5.1 Elementary materials. Materials required to be noncombustible shall be tested in accordance with ASTM E136 <u>or ASTM E2652</u>.

Add new standard to Chapter 35 as follows:

ASTM
<u>E2652-09, entitled Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C</u>

Reason: There is a need for expanding the criteria used for "noncombustible material" in the IBC. Several of the I-Codes have varying definitions of the term "non-combustible material", each based upon the way in which the concept of "non-combustible" is used within that Code. Throughout the ICC code system, the concept of "noncombustible material" is based on the idea that the material should not ignite or burn when subjected to fire or heat

Justification: The concept of "noncombustible materials" and "noncombustibility" in terms of types of construction is widely used throughout the International Codes. The IBC, IFC, IEBC and IFGC do not contain a separate definition of "noncombustible", even though they use the terminology "non-combustible materials".

In common usage, the term "noncombustible" is used to denote materials which do not ignite or are not capable of sustaining combustion. The common Dictionary definitions for "noncombustible" are typically as follows:

> **Noncombustible, adj** – not capable of igniting and burning (Webster's Third New International Dictionary of the English Language, Unabridged, 2007)

In the traditional use of the terminology and concept of "non-combustible" in the Codes has been based on acceptable performance when tested in accordance with ASTM E136, <u>*Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C*</u>. Materials passing the test are permitted limited flaming and other indications of combustion. However, these have traditional been acceptable. Understandably, ASTM E136 does not replicate the full spectrum of actual building fire exposure conditions. However, this test method does provide an assessment indicating those materials which do not act to aid combustion or add appreciable heat to an ambient fire.

ASTM has recently published another standard ASTM E2652-09, entitled <u>*Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*</u>. This test method is similar to ASTM E136, and based more on the international standard for noncombustibility. The key difference between the two standards is in the equipment. The apparatuses in this test method and in Test Method E 136 is that the furnace tube in this test method has a conical air-flow stabilizer section attached at its bottom. Both test methods use cylindrical furnace tubes. The test Standard does not include mandatory pass/fail criterion. It allows those criteria to be determined by the Codes or other users. Appendix X3 also contains a comparison of results obtained from this apparatus versus ASTM E136. ASTM E136 has also been revised to include ASTM E2652 as an alternate methodology..

Cost Impact: This proposal does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2652-09 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.5.1-FS-CRIMI

FS11 – 12
703.7

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing Washington Association of Building Officials Technical Code Development Committee (maureen.traxler@seattle.gov)

Revise as follows:

703.7 Marking and identification. Where there is an accessible concealed floor, floor-ceiling or *attic* space, ~~Fire~~ *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:

~~1.~~ ~~Be located in accessible concealed floor, floor-ceiling or *attic* spaces~~;

~~2~~1. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition; and

~~3~~ 2. Include lettering not less than 3 inches (76 mm) in height with a minimum 3/8 inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording. "FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS" or other wording.

~~**Exception:** Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space~~.

Reason: Section 703.7 was meant to require that the markings on fire-resistance rated assemblies only where there is an accessible space. This proposal modifies the code language to state that requirement more clearly. As written, this section requires the marking to be located in a concealed accessible space, so it requires construction of a concealed space where one would not otherwise be installed.

The exception is deleted because it becomes redundant when the charging language is clarified. If Committee feels it is necessary to maintain the exception, then it could be retained without changing the intent of the section. However, as written, the exception is unclear about what the exception applies to. Since it is indented under item 3, it appears to be an exception from the provisions related to the size of lettering.

Cost Impact: The code change proposal will not increase the cost of construction.

FS11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.7-FS-TRAXLER

FS12 – 12
704.4, 704.4.2 (New)

Proponent: Daniel E. Nichols, P.E., New York State Division of Code Enforcement and Administration, Albany, NY (dan.nichols@dos.state.ny.us)

Revise as follows:

704.4 Protection of secondary members. Secondary members that are required to have a *fire-resistance rating* shall be protected by individual encasement protection. ~~by the membrane or ceiling of a *horizontal assembly* in accordance with Section 711, or by a combination of both.~~

<u>**704.4.2 Horizontal Assemblies.** Horizontal assemblies are permitted to be protected with a membrane or ceiling when the membrane or ceiling provides the required fire-resistance rating and are installed in accordance with Section 711.</u>

Reason: The purpose of this proposal is to provide the code user better direction when dealing with horizontal assemblies that require a fire-resistance rating. Currently, the section is written in a way that confuses the reader by addressing all secondary structural elements and then providing a horizontal assembly alternative compliance design. If the reader were to stop reading, the following section for bearing walls for light-frame construction would be missed. This proposal separates the horizontal assemblies out of the charge section for secondary member fire resistance requirements.

Another reason for this proposal is to clarify the requirements for membrane protection of horizontal assemblies. Currently, the only direction is to Section 711. Within Section 711, there is no direct requirement on how to handle the design of a horizontal assembly when the structural members within such assembly are required to be fire-resistance-rated. The only direction within the section is how to calculate fire resistance for mixed use occupancies and fire areas. The issue with this is that the calculation is for the 'separation' of spaces rather than the 'protection' of structural elements; with the separation calculation permitting the use of the structural member (and associated bay spaces) and the floor deck and finishes to be calculated in the fire-resistance. This calculation does not provide the needed fire-resistance-rating to the structural member.

The differences in fire-resistance of commonly used rated floor assemblies can be seen using directories; such as UL's fire resistance directories for rated floors. Whereas the assemblies are rated for 1-hour, the 'finish rating' is also published at a value the is lower than the 1-hour rating since such 'finish rating' test calculates only the material that is protecting the structural member. To look at this proposal another way, the real-world reason is to ensure designers are using the finish rating calculation to determine compliance for floor member rating requirements as it applies to the requirements of Chapter 6.

Section 711 is retained to deal with installation requirements such as penetrations, ducts, and joints.

Cost Impact: This will not increase the cost of construction since this is already required by the IBC.

FS12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

704.4-FS-NICHOLS

FS13 – 12
704.4.1

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

704.4 Protection of secondary members. Secondary members that are required to have a *fire-resistance rating* shall be protected by individual encasement protection, by the membrane or ceiling of a *horizontal assembly* in accordance with Section 711, or by a combination of both.

704.4.1 Light-frame construction. ~~King~~ ~~s~~<u>S</u>tuds and boundary elements that are integral elements in *load-bearing walls* of light-frame construction shall be permitted to have required *fire-resistance ratings* provided by the membrane protection provided for the *load-bearing wall*.

Reason: The 2009 IBC Commentary describes the rationale: "Historically, codes have considered king and jack studs in light – frame construction as standard parts of the wall assembly. King studs have essentially the same function, load ratio, and thermal properties as the other studs in the load-bearing wall, and there is no need for them to be considered separate distinct column elements." Given that king studs are just like "regular studs", there is no reason to make the distinction here and then explain in the commentary that no distinction in function exists. Of course, with the successful passage of this proposal, the commentary should be changed to reflect the reverse in this section, saying that this used to say king studs but since they are exactly like other studs in function, this section no longer makes the distinction and that neither regular studs, nor king studs need the individual protection required of other secondary members in a manner similar to that of horizontal secondary structural members regulated by Section 704.4.

Cost Impact: The code change proposal will not increase the cost of construction.

FS13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

704.4.1-FS-FRANCIS

FS14 – 12
705.2

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways and ramps shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend any closer to the line used to determine the fire separation distance than shown in Table 705.2.

> **Exception:** Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section for projections between the buildings.

Reason: As written, this would exempt the building(s) from all projection regulations, even those to property lines. The exception should only apply to those projections between the buildings being considered as one building.

Cost Impact: This code change proposal will not increase the cost of construction.

FS14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.2-FS-GODWIN

FS15 – 12
Table 705.2

Proponent: Don Davies and Larry Lincoln, Salt Lake City Corporation, representing Utah Chapter of ICC (don.davies@slcgov.com)

Revise as follows:

TABLE 705.2
MINIMUM DISTANCE OF PROJECTION

FIRE SEPARATION DISTANCE (FSD)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 feet to less than 2 feet	Projections not permitted
2 feet to less than 5 feet	24 inches
5 feet or greater	40 inches[a]

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm

a. The minimum distance from the line used to determine FSD shall be allowed to be 24 inches (61 mm) where the building is equipped throughout with an automatic sprinkler system in accordance with section 903.3.1.1 or 903.3.1.2, including the underside of the projecting element.

Reason: This new table in the International Building Code (IBC) has simplified the rationale and approach to providing a reasonable level of safety to building projections and balconies. However, we have a concern with the new table:

- Buildings placed further from the property line are seemingly penalized with a greater fire separation distance requirement Including our proposed footnote (a) provides justification for reducing the fire separation distance from the projection for logical reasons. This also creates an incentive for sprinkler protection for the projections. (This is particularly compelling in situations involving decks and balconies, which pose a greater fire hazards due to the possible storage and use of fire wood and barbeque grills).

Further rationale for the proposed change is an increased interest in maximizing the building footprint on small lots. Balcony projections can be common on all sides of buildings designed for these small lots; even those sides which are close to the lot line. This provision is tied to I.B.C. Table 705.8 which allows openings in the exterior wall up to 36" from the lot line if the building is equipped with ('sprinkler protection'). Also, a higher percentage of the wall is allowed unprotected openings if the building is so equipped. Our contention is, that for such buildings, a reduction in the fire separation distance would be justified especially if the balcony was sprinkler protected. In addition, the 'sprinkler protected' exception three and four for balconies and similar projections in I.B.C. Section 1406.3 insinuates that sprinkler protection of balconies is the preferred alternative, as opposed to fire-retardant treated wood or one-hour construction.

In conclusion, we feel that providing sprinkler protection on balconies and similar projections would be the preferred solution as opposed to passive fire-protective measures to provide fire-resistance, since fire-resistance rated construction will not suppress a fire nor lessen the fire exposure to a building from the same lot or from adjoining lots.

Cost Impact: None

Analysis: FS15, FS16, FS17 and FS18 provide different options for Table 705.2. The committee needs to make its intent clear with respect to these provisions.

FS15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T705.2-FS-DAVIES-LINCOLN

FS16 – 12
Table 705.2

Proponent: Homer Maiel, PE, CBO, Town of Atherton, representing ICC Tri-Chapter (Peninsula, East Bay, and Monterey Bay)

Revise as follows:

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways and ramps shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend any closer to the line used to determine the fire separation distance than shown in Table 705.2.

Table 705.2
MINIMUM DISTANCE OF PROTECTION

FIRE SEPARATION DISTANCE (FSD)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 feet to less than ~~2~~ 3 feet	Projections not permitted
~~2 feet to less than 5 feet~~ 3 feet	24 inches
~~5 feet or~~ greater than 3 feet	~~40 inches~~ 24 inches plus 8 inches for every foot thereafter

Exception: Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

Reason: The current code language which was changed as the result of approval of FS12-09/10 in Baltimore, has simplified the projection requirements a great deal. However, there is a flaw in Table 705.2.

In Fig.1, I am trying to compare 2009 requirements with 2012. In 2009 code, the projection was a function of, 1) distance of exterior face of the wall to the lot line where protected openings or a combination of protected and unprotected openings are required, 2) automatic sprinkler systems. The 2012 code simplifies Section 705.2 by eliminating both of those requirements. In 2012, the only function is FSD. Once FSD is determined, then the projection is measured from FSD. This is shown in Fig. 1.

In Table 705.2, the third row is where the flaw appears. For example, if the FSD is 4 feet, then the minimum distance for projection to FSD is 24 inches. That means the maximum allowable projection can be 24 inches (48" – 24"). On the other hand, if FSD is 5 feet, then the minimum distance from the line used to determine FSD is 40". That means that projection can only be 20" (60"- 40"). Less projection is allowed for 5' FSD than 4' FSD!! This is clearly shown in Fig. 2. Also Fig. 3 shows this flaw and at the same time 2009 and 2012 have been compared graphically.

The new proposal still maintains the simplicity that is introduced in 2012 along with incorporating 2009 numbers.

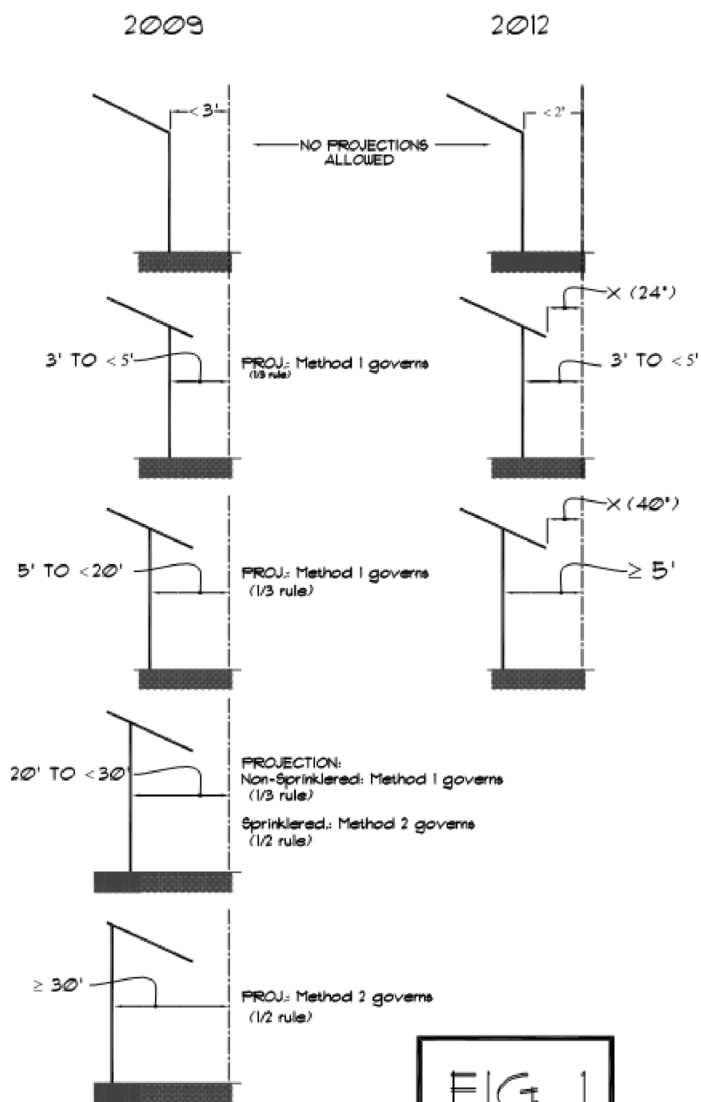
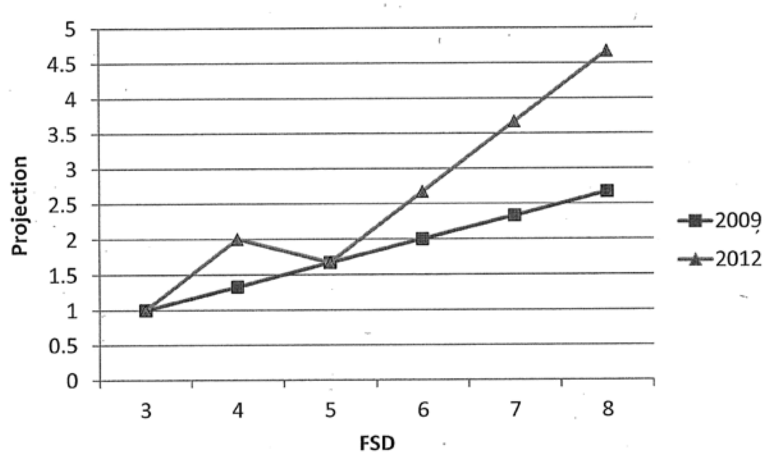

2009
2012
< 3'
< 2'
NO PROJECTIONS ALLOWED
3' TO < 5'
PROJ.: Method 1 governs
(1/3 rule)
X (24")
3' TO < 5'
5' TO < 20'
PROJ.: Method 1 governs
(1/3 rule)
X (40")
≥ 5'
20' TO < 30'
PROJECTION:
Non-Sprinklered: Method 1 governs
(1/3 rule)
Sprinklered.: Method 2 governs
(1/2 rule)
≥ 30'
PROJ.: Method 2 governs
(1/2 rule)

FIG. 1

Fig. 2

<table>
<tr><th>FSD</th><th colspan="4">2009</th><th colspan="2">2012</th></tr>
<tr><td>< 2'</td><td colspan="4">NP</td><td colspan="2">NP</td></tr>
<tr><td rowspan="2">2' - < 3'</td><td colspan="4" rowspan="2">NP</td><td>Proj.</td><td>From Edge of Proj. to PL (x)</td></tr>
<tr><td>0.9'</td><td>2'</td></tr>
<tr><td rowspan="2">3'</td><td colspan="2">Proj.</td><td colspan="2">X</td><td rowspan="2">1'</td><td rowspan="2">2'</td></tr>
<tr><td colspan="2">1'</td><td colspan="2">2'</td></tr>
<tr><td>4'</td><td colspan="2">1.33</td><td colspan="2">2.67</td><td>2'</td><td>2'</td></tr>
<tr><td>5'</td><td colspan="2">1.67</td><td colspan="2">3.33 (40")</td><td>1.67</td><td>3.33 (40")</td></tr>
<tr><td>6'</td><td colspan="2">2</td><td colspan="2">4</td><td>2.67</td><td>3.33 (40")</td></tr>
<tr><td>7'</td><td colspan="2">2.33</td><td colspan="2">4.67</td><td>3.67</td><td>3.33 (40")</td></tr>
<tr><td>8'</td><td colspan="2">2.67</td><td colspan="2">5.33</td><td>4.67</td><td>3.33 (40")</td></tr>
<tr><td>...</td><td colspan="2">...</td><td colspan="2">...</td><td>...</td><td>...</td></tr>
<tr><td rowspan="3">20'</td><td colspan="2">Sprk.</td><td colspan="2">Non-Sprk.</td><td rowspan="3">16.67</td><td rowspan="3">3.33 (40")</td></tr>
<tr><td>Proj</td><td>X</td><td>Proj</td><td>X</td></tr>
<tr><td>10</td><td>10</td><td>6.67</td><td>13.3</td></tr>
</table>

Fig. 3



Cost Impact: This code change will not increase the cost of construction.

Analysis: FS15, FS16, FS17 and FS18 provide different options for Table 705.2. The committee needs to make its intent clear with respect to these provisions.

FS16-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T705.2-FS-MAIEL

FS17 – 12
705.2, Table 705.2

Proponent: Ali M. Fattah, P.E., City of San Diego, representing the San Diego Area Chapter of ICC (afattah@sandiego.gov)

Revise as follows:

705.1 General. *Exterior walls* shall comply with this section.

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways and ramps shall also comply with Sections 1019 and 1026, respectively. Projections shall not ~~extend any closer to the line used to determine~~ encroach into the fire separation distance more than the distance determined from ~~than shown~~ ~~in~~ Table 705.2.

TABLE 705.2
MINIMUM DISTANCE OF PROJECTION

FIRE SEPARATION DISTANCE (FSD)	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)	
	Sprinkler Protected (S)	Non-sprinkler Protected (NS)
0 feet to less than 2 feet	Projections not permitted	Projections not permitted
~~2 feet to less than 5~~	~~24 inches~~	
~~5 feet or greater~~	~~40 inches~~	
2 feet to less than 20	2/3 of the fire separation distance	2/3 of the fire separation distance
20 feet to less than 30 ft	½ of the fire separation distance	2/3 of the fire separation distance
30 feet or greater	10 ft	15 ft

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.

Reason: This proposed change to modify Table 705.2 is necessary due to consequences of approval and adoption of FS 12-09/10 into the table. The 2012 IBC permits a large outdoor seating area of restaurant that includes seating or other useable space below to be located a distance of up to 40inch from a lot line. This same condition under a legacy code would have resulted in distances such as 13.33 ft or 6.67 ft depending on the type of construction. While the 2006 IBC implied that a projection projects beyond the building areas, the 2009 IBC and subsequent edition changed the description to be beyond the exterior wall. As a consequence a post and beam supported attached deck or cantilevered balconies can be considered to be projections and often include useable space beneath them.

As an example the 2012 IBC allows a 5 stories plus mezzanine R-2 occupancy constructed of Type III A Sprinkler protected construction can be located 15 ft from a lot line and can include a 11 ft 8 inch deep balcony on the side of the building stacked on every level and 75% of the exterior wall can include unprotected openings. The projection should be limited to 5 ft to allow 10 ft (2/3 of the fire separation distance to be unobstructed).

- Sprinkler protection of the useable space beneath the projection does not adequately protect the hazard; if it did the code would have permitted enclosed sprinkler protected space.
- What would occur if the resident chooses to glaze the balcony by adding windows on top of the guard, would that constitute an opening and if so will that make the condition worse to cause non-compliance? Does not including a window above the guard make the condition better?

The limitation on the length of projections encroaching into the fire separation distance is to limit combustibles in the building construction and furnishings that can expose adjacent buildings. Table 705.2 and Section 705.2 do not differentiate between combustible and non-combustible construction. This code change attempts to make that differentiation and includes the requirements in 2009 IBC Section 705.2 in tabular form.

- Exterior exit balconies are required in Section 1019.4 to be 10 ft away from unprotected openings in adjacent buildings or from lot lines to allow occupants to safely egress through exterior egress balconies.
- It makes no sense to protect the exterior walls of a building per TABLE 602 and to allow elements that bring the fire loading closer to a neighboring building.
- Exterior walls are protected to prevent their collapse and thereby preventing larger openings in collapsed walls that would expose neighboring buildings.

- Section 1406.3 does not adequately address the issues of balconies since it is mainly concerned with flammability of the construction and impacts the exterior of the building.

Technical justification is not available through the activities of the various code drafting and code development committees to substantiate the reason for the limitations and to facilitate engineering based justification. It seems reasonable to expect that 2/3 or 1/2 of the fire separation remain clear to prevent the spread of fire to neighboring structures and buildings.

Determination of the permissible length for projections based on fire separation distance has been problematic since the development of the IBC working draft in 1997. At that time the drafting committee adopted the UBC's permissible projection measurement methodology and triggered it based the IBC's opening protection table (opening limitation and size control table) initially for combustible projections and then in the final draft projections in general. The problem arises due to the fact that IBC Table 705.8 limits the area of exterior wall openings as a percentage of the exterior wall area based on fire separation distance, whether or not the opening is fire resistance rated and whether the building is protected throughout with an automatic fire sprinkler system.

- The legacy code from which Section 705.2 was developed offered fewer options and triggered opening protection at 3 ft, 10 ft or 20ft fire separation distance based on occupancy and type of construction. Openings were limited to a maximum of 50% of the area of the wall per story.
- Projection limitations were simpler to determine under the legacy code since only a limited number of distances based on the occupancy and type of construction of the building. Furthermore, most legacy code users considered the edge of the project to create an exterior wall opening since the area below the projection created building area.

Several code change proposals in the last three code cycles sought to remedy this situation and were submitted by groups that had used the same legacy code.

- FS 70-03/04 was submitted but not approved to account to limit projections in locations due to requirements in other than Section 704.
- FS 16-06/07 Section 704.2 was proposed without limitations to the separation to a lot line or imaginary line for non-combustible projections. Section 704.2.3 proposed to require that combustible projections be protected for 1 hour when located closer than 6 ft from a lot line or imaginary line. This proposed code change was not approved.
- FS 14-07/08 and FS 15-07/08 were submitted and the latter code change was published in the 2009 IBC. The 2009 IBC includes two triggers that differentiate between whether opening protection is required or not by 2009 IBC Table 705.8.
- FS 11-09/10 and FS 12-09/10 sought to simplify Section 705.2 of the 2009 IBC by displaying the projection limitations in tabular form. The latter code change was approved and published in the 2012 IBC after approval of public comment. The first code change sought limit the projections based on occupancy, type construction and fire separation distance.

As an example of the differences to what a legacy code the Uniform Building Code would have required I have attached a summary table showing the projection limitations.

TABLE 705.2
MINIMUM DISTANCE TO PROJECTION
Based on 1997 UBC

FIRE SEPARATION DISTANCE X (feet)	TYPE OF CONSTRUCTION	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)				
		OCCUPANCY GROUP A-1, A-2, A2.1, A-3, A-4	OCCUPANCY GROUP B, F-1, M, S-1, S-3	OCCUPANCY GROUP E-1, E-2, E-3, F-2, S-2, H-2, H-3, H-4, H-6, H-7 A, B, E, F-2, I, R, S-2, U	OCCUPANCY GROUP I1.1, I1.2, I-2, I-3, R-1	OCCUPANCY GROUP R-3
X ≤ 3 ft	All	NP	NP	NP	NP	1 ft
3 < X ≤ 5	I A, IB	NP	NP	NP (F-2, S-2 2/3)	NP (R-1 2/3)	2/3
	II A, IIB	NP	NP	NP	NP	2/3
	III, IV	NP	NP	NP	NP (R-1 2/3)	2/3
	V	NP	NP	NP	NP	2/3

FIRE SEPARATION DISTANCE X (feet)	TYPE OF CONSTRUCTION	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)				
		OCCUPANCY GROUP A-1, A-2, A2.1, A-3, A-4	**OCCUPANCY GROUP B, F-1, M, S-1, S-3**	**OCCUPANCY GROUP E-1, E-2, E-3, F-2, S-2, H-2, H-3, H-4, H-6, H-7 A, B, E, F-2, I, R, S-2, U**	**OCCUPANCY GROUP I1.1, I1.2, I-2, I-3, R-1**	**OCCUPANCY GROUP R-3**
5 < X ≤ 10	I A, IB	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	II A, IIB	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	III, IV	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	V	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
10 < X ≤ 20	I A, IB	2/3 (A-2, A2.1 A-3 A-4 6.7ft) (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	II A, IIB	2/3 (A-2, A2.1 A-3 A-4 13.33 ft) (H-5 NP)	6.7 ft (H-5 NP)	2/3 (E 13.33 ft (H-5 NP)	2/3 (I-2 13.33 ft) (H-5 NP)	2/3 (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
	III, IV	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	V	2/3 (A-4 6.7ft) (H-5 NP)	6.7 ft (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP) (I-2 13.33 ft)	2/3 (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
20 < X ≤ 60	I A, IB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	II A, IIB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	III, IV	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	V	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
20 < X ≤ 60	I A, IB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	II A, IIB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	III, IV	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	V	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP) (R-1 3.33 ft, R-3 2 ft)

FIRE SEPARATION DISTANCE X (feet)	TYPE OF CONSTRUCTION	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)				
		OCCUPANCY GROUP A-1, A-2, A2.1, A-3, A-4	OCCUPANCY GROUP B, F-1, M, S-1, S-3	OCCUPANCY GROUP E-1, E-2, E-3, F-2, S-2, H-2, H-3, H-4, H-6, H-7 A, B, E, F-2, I, R, S-2, U	OCCUPANCY GROUP I1.1, I1.2, I-2, I-3, R-1	OCCUPANCY GROUP R-3
X ≥ 60	I A, IB	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)
	II A, IIB	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)
	III, IV	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)
	V	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)

Reason: This proposed This code change to Table 705.2 is necessary since the table allows a 4 story Type VB building required to have protected exterior walls and exterior wall openings to include balconies used in restaurants or as a projection from dwellings to be located 40 inches from a lot line and thereby introducing a fire load that exposes a neighboring building. Exterior exit balconies are required in Section 1019.4 to be 10 ft away from unprotected openings in adjacent buildings or from lot lines to allow occupants to safely egress through exterior egress balconies. It makes no sense to protect the exterior walls of a building per TABLE 602 and to allow elements that bring the fire loading closer to a neighboring building. Section 1406.3 does not adequately address the issues of balconies since it is mainly concerned with flammability of the construction as to impacts the exterior of the building. The code change that resulted in the table was well intentioned and resulted in a simplified table and sought to establish a single line beyond which projection could not be closer to a lot line. However the IBC's fire separation concept involves triggering requirements based on the actual location of the building and establishing a uniform line may be less restrictive for larger buildings constructed of higher types of construction and housing higher hazard occupancies.

Code changes FS11–09/10 and FS12-09/10 http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/FAA/IBC-FS_%20FS2-FS100.pdf , the latter of which was approved after public comment and adopted into the 2012 IBC, sought to address an issue that arose from combining projection requirements driven through opening protection that was developed under a legacy code with the revised opening protection philosophy of the IBC that limits the size of openings within fire separation distance ranges. Legacy codes required opening protection for openings located in walls located at a fire separation distance less than a predetermined distance. As a consequence the length of projections was limited when based on the distance where opening protection was first required. Projections, especially projections providing shelter for useable spaces such as patios used typically in residential occupancies and drinking and dining establishments as well as offices and educational occupancies. I

BC Section 1019.4 requires that exterior egress balconies be located not less than 10 ft from a lot line or a building to protect occupants in the means of egress from unprotected exposures, and this separation is required regardless of whether sprinkler protection is provided. It therefore makes no sense to permit a balcony located on a hi-rise building with a fire separation distance of 20 ft to be located up to 44 inches from a lot line even if sprinkler protection is provided for.

The useable balcony whether cantilevered or supported extends beyond the exterior wall and allows for combustible furnishings to be located in close proximity to a neighboring building. The IBC intends for fire separation to occur through distance, 30 ft or more to a lot line or imaginary line, or through exterior wall and opening protection. By protecting exterior walls and limiting the amount of exterior wall openings the IBC seeks to contain fire within the area of origin and to limit exposure to neighboring buildings due to the premature collapse of the exterior wall resulting in larger exterior wall openings or due to large unprotected openings that allow fire to spread to adjacent buildings and areas. Projections were proportioned to allow 2/3 of the space between the building and the lot line/imaginary line to be open and therefore allow for heat, flame and products of combustion to disperse. The 2009 IBC gave credit for sprinklers to allow for a level of protection and allowed a reduction to ½ the distance when the building is protected throughout with a fire sprinkler system.

FIRE SEPARATION DISTANCE	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)

<u>**X (feet)**</u>	<u>Sprinkler Protected (S)</u>	<u>Non-sprinkler Protected (NS)</u>
<u>X ≤ 2 ft</u>	<u>NP</u>	<u>NP</u>
<u>X ≤ 3 ft</u>	<u>1 ft</u>	<u>NP</u>
<u>2 < X < 5</u>	<u>1.67 ft</u>	<u>1.67 ft</u>
<u>5 ≤ X < 10</u>	<u>6.67 ft</u>	<u>6.67 ft</u>
<u>10 ≤ X < 15</u>	<u>10 ft</u>	<u>10 ft</u>
<u>15 ≤ X < 20</u>	<u>13.3 ft</u>	<u>13.3 ft</u>
<u>20 ≤ X < 30</u>	<u>15 ft</u>	<u>20 ft</u>
<u>30 feet or greater</u>	<u>15 ft</u>	<u>20 ft</u>

Reason: This code change is necessary to allow storage rooms and closets located in any occupancy to not be considered an S occupancy. The revisions to the incidental uses Table 509 over the last two code cycles removed small storage rooms as a consequence they need to be classified as Group S and considered accessory use or a separated or non-separated occupancy.

Closets and storage rooms located in occupancies located in multistory buildings permitted otherwise to be of non-rated construction will be limited to buildings constructed of Type VA, IIIA or IIA construction or better. For example storage rooms and closets located above the second floor in a Group R-1 or Group R-2 occupancy four stories in height will require one-hour construction throughout or will not be permitted above the second story. Another example is a janitor's closet in a common area or a janitors closet located within a multi-tenant building. Proposed exception 4 seeks to address this issue.

A small electrical/mechanical room located on the 5th floor of a type IIB building would not be permitted as accessory uses since Section 508.2.3 requires that the allowable height be established without increase for the accessory use. The electrical code and mechanical code and incidental use requirements will require the appropriate separation from the remainder of the building where appropriate. Proposed exception 5 addresses this issue.

Cost Impact: None. The code change proposal will not increase the cost of construction.

Analysis: FS15, FS16, FS17 and FS18 provide different options for Table 705.2. The committee needs to make its intent clear with respect to these provisions.

FS17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T705.2 #1-FS-FATTAH

FS18 – 12
705.2, Table 705.2

Proponent: Ali M. Fattah, P.E., City of San Diego, representing the San Diego Area Chapter of ICC (afattah@sandiego.gov)

Revise as follows:

705.1 General. *Exterior walls* shall comply with this section.

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways and ramps shall also comply with Sections 1019 and 1026, respectively. Projections shall not ~~extend any closer to the line used to determine~~ encroach into the fire separation distance more than the distance determined from ~~than shown~~ ~~in~~ Table 705.2.

~~TABLE 705.2~~
~~MINIMUM DISTANCE OF PROJECTION~~

~~**FIRE SEPARATION DISTANCE (FSD)**~~	~~**MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD**~~
~~0 feet to less than 2 feet~~	~~Projections not permitted~~
~~2 feet to less than 5~~	~~24 inches~~
~~5 feet or greater~~	~~40 inches~~

TABLE 705.2
MINIMUM DISTANCE OF PROJECTION

FIRE SEPARATION DISTANCE X (feet)	**TYPE OF CONSTRUCTION**	**MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)**	
		Sprinkler Protected (S)	Non-sprinkler Protected (NS)
X ≤ 2 ft	All	NP	NP
2 ≤ X = 3 ft	All	1 ft	NP
3 < X < 20	I , II	½ of the fire separation distance	½ of the fire separation distance
	III, IV, V	2/3 of the fire separation distance	2/3 of the fire 2/3 of the fire separation distance
20 ≤ X < 30	I, II	½ of the fire the fire separation distance	½ of the fire the fire separation distance
	III, IV, V	½ of the fire the fire separation distance	2/3 of the fire separation distance
X ≥ 30	All	10 ft	15 ft

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.

Reason: This proposed change to replace Table 705.2 is necessary due to consequences of approval and adoption of FS 12-09/10 into the table. The 2012 IBC permits a large outdoor seating area of restaurant that includes seating or other useable space below to be located a distance of up to 40inch from a lot line. This same condition under a legacy code would have resulted in distances such as 13.33 ft or 6.67 ft depending on the type of construction. While the 2006 IBC implied that a projection projects beyond the building areas, the 2009 IBC and subsequent edition changed the description to be beyond the exterior wall. As a consequence a post and beam supported attached deck or cantilevered balconies can be considered to be projections and often include useable space beneath them. This code change differentiates between combustible and non-combustible projections due a substantial reduction in the combustible loading contributed by the building construction.

As an example the 2012 IBC allows a 5 stories plus mezzanine R-2 occupancy constructed of Type III A Sprinkler protected construction can be located 15 ft from a lot line and can include a 11 ft 8 inch deep balcony on the side of the building stacked on every level and 75% of the exterior wall can include unprotected openings. The projection should be limited to 5 ft to allow 10 ft (2/3 of the fire separation distance to be unobstructed).

- Sprinkler protection of the useable space beneath the projection does not adequately protect the hazard; if it did the code would have permitted enclosed sprinkler protected space.
- What would occur if the resident chooses to glaze the balcony by adding windows on top of the guard, would that constitute an opening and if so will that make the condition worse to cause non-compliance? Does not including a window above the guard make the condition better?

The limitation on the length of projections encroaching into the fire separation distance is to limit combustibles in the building construction and furnishings that can expose adjacent buildings. Table 705.2 and Section 705.2 do not differentiate between combustible and non-combustible construction. This code change attempts to make that differentiation and includes the requirements in 2009 IBC Section 705.2 in tabular form.

- Exterior exit balconies are required in Section 1019.4 to be 10 ft away from unprotected openings in adjacent buildings or from lot lines to allow occupants to safely egress through exterior egress balconies.
- It makes no sense to protect the exterior walls of a building per TABLE 602 and to allow elements that bring the fire loading closer to a neighboring building.
- Exterior walls are protected to prevent their collapse and thereby preventing larger openings in collapsed walls that would expose neighboring buildings.
- Section 1406.3 does not adequately address the issues of balconies since it is mainly concerned with flammability of the construction and impacts the exterior of the building.

Technical justification is not available through the activities of the various code drafting and code development committees to substantiate the reason for the limitations and to facilitate engineering based justification. It seems reasonable to expect that 2/3 or 1/2 of the fire separation remain clear to prevent the spread of fire to neighboring structures and buildings.

Determination of the permissible length for projections based on fire separation distance has been problematic since the development of the IBC working draft in 1997. At that time the drafting committee adopted the UBC's permissible projection measurement methodology and triggered it based the IBC's opening protection table (opening limitation and size control table) initially for combustible projections and then in the final draft projections in general. The problem arises due to the fact that IBC Table 705.8 limits the area of exterior wall openings as a percentage of the exterior wall area based on fire separation distance, whether or not the opening is fire resistance rated and whether the building is protected throughout with an automatic fire sprinkler system.

- The legacy code from which Section 705.2 was developed offered fewer options and triggered opening protection at 3 ft, 10 ft or 20ft fire separation distance based on occupancy and type of construction. Openings were limited to a maximum of 50% of the area of the wall per story.
- Projection limitations were simpler to determine under the legacy code since only a limited number of distances based on the occupancy and type of construction of the building. Furthermore, most legacy code users considered the edge of the project to create an exterior wall opening since the area below the projection created building area.

Several code change proposals in the last three code cycles sought to remedy this situation and were submitted by groups that had used the same legacy code.

- FS 70-03/04 was submitted but not approved to account to limit projections in locations due to requirements in other than Section 704.
- FS 16-06/07 Section 704.2 was proposed without limitations to the separation to a lot line or imaginary line for non-combustible projections. Section 704.2.3 proposed to require that combustible projections be protected for 1 hour when located closer than 6 ft from a lot line or imaginary line. This proposed code change was not approved.
- FS 14-07/08 and FS 15-07/08 were submitted and the latter code change was published in the 2009 IBC. The 2009 IBC includes two triggers that differentiate between whether opening protection is required or not by 2009 IBC Table 705.8.
- FS 11-09/10 and FS 12-09/10 sought to simplify Section 705.2 of the 2009 IBC by displaying the projection limitations in tabular form. The latter code change was approved and published in the 2012 IBC after approval of public comment. The first code change sought limit the projections based on occupancy, type construction and fire separation distance.

As an example of the differences to what a legacy code the Uniform Building Code would have required I have attached a summary table showing the projection limitations.

TABLE 705.2
MINIMUM DISTANCE TO PROJECTION
Based on 1997 UBC

FIRE SEPARATION DISTANCE X (feet)	TYPE OF CONSTRUCTION	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)				
		OCCUPANCY GROUP A-1, A-2, A2.1, A-3, A-4	OCCUPANCY GROUP B, F-1, M, S-1, S-3	OCCUPANCY GROUP E-1, E-2, E-3, F-2, S-2, H-2, H-3, H-4, H-6, H-7 A, B, E, F-2, I, R, S-2, U	OCCUPANCY GROUP I1.1, I1.2, I-2, I-3, R-1	OCCUPANCY GROUP R-3
X ≤ 3 ft	All	NP	NP	NP	NP	1 ft
3 < X ≤ 5	I A, IB	NP	NP	NP (F-2, S-2 2/3)	NP (R-1 2/3)	2/3
	II A, IIB	NP	NP	NP	NP	2/3
	III, IV	NP	NP	NP	NP (R-1 2/3)	2/3
	V	NP	NP	NP	NP	2/3
5 < X ≤ 10	I A, IB	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	II A, IIB	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	III, IV	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	V	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
10 < X ≤ 20	I A, IB	2/3 (A-2, A2.1 A-3 A-4 6.7ft) (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	II A, IIB	2/3 (A-2, A2.1 A-3 A-4 13.33 ft) (H-5 NP)	6.7 ft (H-5 NP)	2/3 (E 13.33 ft (H-5 NP)	2/3 (I-2 13.33 ft) (H-5 NP)	2/3 (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
	III, IV	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP)
	V	2/3 (A-4 6.7ft) (H-5 NP)	6.7 ft (H-5 NP)	2/3 (H-5 NP)	2/3 (H-5 NP) (I-2 13.33 ft)	2/3 (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
20 < X ≤ 60	I A, IB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	II A, IIB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	III, IV	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	V	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
20 < X ≤ 60	I A, IB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	II A, IIB	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)
	III, IV	13.33 ft	13.33 ft	13.33 ft	13.33 ft	13.33 ft

FIRE SEPARATION DISTANCE X (feet)	TYPE OF CONSTRUCTION	MINIMUM DISTANCE TO PROJECTION FROM LINE USED TO DETERMINE (FSD)				
		OCCUPANCY GROUP A-1, A-2, A2.1, A-3, A-4	**OCCUPANCY GROUP B, F-1, M, S-1, S-3**	**OCCUPANCY GROUP E-1, E-2, E-3, F-2, S-2, H-2, H-3, H-4, H-6, H-7 A, B, E, F-2, I, R, S-2, U**	**OCCUPANCY GROUP I1.1, I1.2, I-2, I-3, R-1**	**OCCUPANCY GROUP R-3**
		(H-5 NP)	(H-5 NP)	(H-5 NP)	(H-5 NP)	(H-5 NP)
	V	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP)	13.33 ft (H-5 NP) (R-1 3.33 ft, R-3 2 ft)
X ≥ 60	I A, IB	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)
	II A, IIB	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)
	III, IV	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)
	V	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)	13.33 ft (H-5 2/3 > 60 ft)

Cost Impact: None. The code change proposal will not increase the cost of construction.

Analysis: FS15, FS16, FS17 and FS18 provide different options for Table 705.2. The committee needs to make its intent clear with respect to these provisions.

FS18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T705.2 #2-FS-FATTAH

FS19 – 12
705.2.3

Proponent: Steve Thomas, Colorado Code Consulting, LLC representing the Colorado Chapter ICC (sthomas@coloradocode.net)

Revise as follows:

705.2.3 Combustible projections. Combustible projections extending to within 5 feet (1524 mm) of the line used to determine the fire separation distance~~, or located where openings are not permitted, or where protection of some openings is required~~ shall be of at least 1-hour fire-resistance- rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

> **Exception:** Type VB construction shall be allowed for combustible projections in Group R-3 and U occupancies with a fire separation distance greater than or equal to 5 feet (1524 mm).

Reason: This section was revised during the last code cycle by several different changes. The deleted language is confusing to the user of the code. The base requirement of 5 feet already addresses projections that are located where openings are prohibited (3 feet). Therefore, the language "or located wher openings are not permitted" is not needed. The language, "or where protection of some openings is required" is very confusing. What does it mean to say some opening protection is required? Is there a certain percentage of openings that makes it "some"? There is no direction for the user of the code to enforce this language.

Cost Impact: The code change proposal will not increase the cost of construction.

FS19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.2.3-FS-THOMAS

FS20 – 12
705.3, Table 705.8

Proponent: Marshall A. Klein, P.E., Marshall A. Klein & Associates, Inc., representing National Multi-Housing Council

Revise as follows:

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection, projections and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them. Space where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exceptions:

1. Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.
2. Where an S-2 parking garage is erected on the same lot as a Group R-2 building, and there is no fire separation distance between these buildings, then the adjoining exterior walls between the buildings are permitted to have occupant use openings in accordance with Section 706.8. However, opening protectives in such openings shall only be required in the exterior wall of the S-2 parking garage, not in the exterior wall openings in the R-2 building, and these opening protectives in the exterior wall of the S-2 parking garage shall be a minimum of 1½ hours fire protection rating.

TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON
FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA[a]
0 to less than 3[b,c,k]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted[k]
	Unprotected, Sprinklered (UP, S)[i]	Not Permitted[k]
	Protected (P)	Not Permitted[k]

(Portions of table not shown remain unchanged)

(Footnotes a through j remain unchanged)
k. For openings between S-2 parking garage and Group R-2 building, see Section 705.3 Exception #2.

Reason: This code proposal attempts to resolve a practical design issue that is extremely common in the design of apartment projects in major urban areas.

The great majority of multi-family projects are being built with parking garages beside the apartment buildings. Access from the parking garage into the apartment unit's floor is provided at each garage floor onto the apartment's floor for convenience as well as for safety for the apartment dwellers. Many designs have one or more of the exterior walls of the parking garage and the apartment building at a 0' fire separation distance. The literal text of the first row of Table 705.8 would prohibit any openings in these exterior walls between the parking garage and the apartment building. However, if these exterior walls were replaced with a fire wall then openings are permitted under Table 705.8 Footnote "c". However, since the parking garage is usually constructed first, and then the apartment building is built next to it, the design and application of a fire wall present major design problems.

The parking garages are usually a minimum of Type I or Type II construction type, whereas the apartment buildings are usually Type III or Type V construction type. The design and tying together two buildings of two different construction types on the same lot is more complicated structurally than designing both buildings with their own exterior walls.

From a life safety/fire protection standpoint, the sprinklered apartment buildings (R-2 use) have one of the best fire safety records of all the occupancies types. The fire history for parking garages shows that most fires are contained to a single vehicle fire.

Since the parking garage and the apartment building are on the same lot there should be no logical reason why opening protectives can not be installed in the exterior walls between these two buildings the same as permitted for openings in a fire wall between two buildings. The only technical reason is that there is no fire door manufacturer that has details on how to install a listed fire door assembly in such walls that would stay in place if one of the exterior walls collapsed. To resolve this dilemma in a reasonable and practical manner, since the apartment building is required to be sprinklered under Section 903.2.8), the fire door assembly would be placed in the exterior wall of the S-2 Parking Garage. If by some chance the R-2 sprinklered building burned to the ground, the openings into the parking garage would still be protected. If by chance the S-2 parking garage burned down to the ground, the sprinklers near the openings in the exterior wall of the R-2 building would provide adequate protection. As mentioned above, based on the past fire history of sprinklered R-2 occupancies and S-2 parking garages the likelihood of either building type burning down to the ground is not very probable.

Cost Impact: Cost savings with no decrease in fire protection or life safety

FS20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.3-FS-KLEIN

FS21 – 12
705.6

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter of ICC (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

705.6 Structural stability. The wall shall extend to the height required by Section 705.11 and <u>all members providing vertical structural support</u> shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*. ~~Where exterior walls have a minimum *fire separation distance* of not less than 30 feet (9144 mm), interior structural elements which brace the exterior wall but which are not located within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements which brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum *fireresistance rating* required in Tables 601 and 602 for the exterior wall.~~

Reason: Several code authorities including the author of this code change and the previous code change (establishing the 30 feet requirement proposed to be deleted above) have interpreted this code section to be a requirement similar to fire walls that the wall would stay in place after the building collapses from a fire internal to the building.

The IBC code and commentary states "This section on structural integrity for exterior walls does not require that the wall remains in place when the structure collapses. That language is only used for fire wall structural integrity."

Given the language in the code and commentary, this code change would clarify the code language so readers of the code better understand the intent.

Cost Impact: This code change will not increase the cost of construction.

Analysis: FS21 and FS22 provide different requirements for exterior wall structural stability. The committee needs to make its intent clear with respect to these provisions.

FS21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.6-FS-RICHARDSON

FS22 – 12
705.6, 706.2

Proponent: Jonathan Siu, representing City of Seattle Department of Planning & Development (jon.siu@seattle.gov)

Revise as follows:

705.6 Protection required for structural stability. ~~The wall~~ Exterior walls shall extend to the height required by Section 705.11 ~~and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*~~. Where exterior walls have a minimum *fire separation distance* of not less than 30 feet (9144 mm), interior structural elements which brace the exterior wall but which are not located within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements which brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Tables 601 and 602 for the exterior wall.

706.2 Protection required for structural stability. ~~Fire walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated by the required *fire-resistance rating*~~ Structural elements which brace the fire wall but are located outside of the fire wall or within the plane of the fire wall shall have the minimum *fire resistance rating* required for the fire wall, or the wall shall be constructed as double fire walls in accordance with NFPA 221.

Reason: The purpose of this code change proposal is to delete the requirements that an exterior walls or fire walls must maintain their stability under real fire conditions for a real-time 1, 2, 3, or 4 hours. This is an inappropriate performance standard for the following reasons:

1. This requirement is unenforceable. It is a common misconception that a given fire-resistance rating means the rated assembly will stand for the stated period of time (in real time) under real fire conditions. However, while the test that establishes the rating provides a common standard (or level playing field) for tested assemblies, it does not necessarily represent the behavior of a real wall under real fire conditions. Stated another way, the test is only meant to measure performance in the given test environment, not to reflect real-world conditions. Because the test standard does not tell you how long in real time the assembly will stand under real fire conditions, there is no method for a design professional (or code official) to determine ahead of time how these assemblies should be constructed given the code requirement—nobody will know until a real fire occurs in the building and someone times how long the wall stands (if it collapses) or if it withstands the fire for the required (real-time) time period.
2. These elements (exterior and fire walls) are being held to a much higher standard than any other element, with no justification. That is, no other element is required to remain in place for the required real time under real-world fire conditions, whether they be horizontal assemblies, or fire barriers protecting an interior exit stair, for example. There is no reason why exterior walls and fire walls should be treated differently than these other equally important elements.
3. If the intent of the deleted text is to require exterior and fire walls to meet the required fire resistance rating, then the text is redundant.
4. If the intent of the requirement in these sections is to require a specific structural design, Chapter 16 doesn't provide sufficient guidance for structural design of wall anchorage that would withstand collapse of a portion of a building. In addition, Chapter 7 is an inappropriate location for structural design requirements.

It is to be noted that this proposal does not take away fire protection. Part of the reason why fire-resistant rated construction is required is to protect the structure. The apparent intent of the text being proposed to be deleted is that the stability of the element (exterior or fire wall) matches the required fire-resistance rating of the assembly. However, this intent is covered by the last sentence in Section 705.6 and the added text to 706.2—the floors and roof stabilize the wall, and they are protected to the same degree the walls are. This text is being proposed to be added to Section 706.2 in order to replace the requirement for real-time structural stability, and retain the parallel requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: FS21 and FS22 provide different requirements for exterior wall structural stability. The committee needs to make its intent clear with respect to these provisions. FS22 and FS27 provide different requirements for fire wall structural stability. The committee needs to make its intent clear with respect to these provisions.

FS22-12

Public Hearing: Committee: AS AM D

Assembly: ASF AMF DF

705.6-FS-SIU

FS23 – 12
Table 705.8

Proponent: Barry Gupton, PE, NC Department of Insurance, Office of State Fire Marshal, Engineering Division (barry.gupton@ncdoi.gov)

Revise as follows:

TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON
FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREAa
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S)i	~~Not Required~~ No Limit
	Protected (P)	~~Not Required~~ No Limit

(Portions of table not shown remain unchanged)

Reason The current wording incorrectly indicates that for Unprotected, Sprinklered and Protected openings which have a fire separation distance of 30' or greater are "Not Required". Actually the areas of these openings are unlimited for these situations except where Note i applies.

Cost Impact: The code change proposal will not increase the cost of construction.

FS23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T705.8-FS-GUPTON

FS24 – 12
705.8.5

Proponent: Steve Pfeiffer representing City of Seattle, Dept of Planning & Development (steve.pfeiffer@seattle.gov)

Revise as follows:

705.8.5 Vertical separation of openings. Openings in *exterior walls* in adjacent *stories* shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower *story* is not a protected opening with a *fire protection rating* of not less than 3/4 hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, *exterior walls* or other similar assemblies that have a *fire-resistance rating* of at least 1 hour<u>, rated for exposure to fire from both sides,</u> or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the *exterior wall*. Flame barriers shall also have a *fire-resistance rating* of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 or UL 263 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.

Exceptions:

1. This section shall not apply to buildings that are three *stories* or less above *grade plane*.
2. This section shall not apply to buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Open parking garages.

Reason: This change is intended to clarify that provisions of Section 705.5, requiring an exterior wall with a fire separation distance of greater than 10 feet to only consider exposure to a fire from the inside, do not apply to Section 705.8.5. Fire separation distance, the critical factor in Section 705.5, to prevent spread of fire from property to property or building to building, plays no role in Section 705.8.5. The hazard, in Section 705.8.5, is of a fire within the building moving from floor to floor via exterior wall openings. It is critical that where a fire-resistive rated spandrel is used in prevention of the spread of fire from floor to floor, the assumed exposure to fire be from both sides of the wall spandrel.

Cost Impact: The code change proposal will not increase the cost of construction.

FS24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.8.5-FS-PFEIFFER

FS25 – 12
705.8.5

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

705.8.5 Vertical separation of openings. Openings in *exterior walls* in adjacent *stories* shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower *story* is not a protected opening with a *fire protection rating* of not less than 3/4 hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, *exterior walls* or other similar assemblies that have a *fire-resistance rating* of at least 1 hour or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the *exterior wall*. Flame barriers shall also have a *fire-resistance rating* of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 or UL 263 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.

Exceptions:

1. This section shall not apply to buildings that are three *stories* or less above *grade plane*.
2. This section shall not apply to buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Open parking garages.
4. Perimeter fire containment systems tested in accordance with ASTM E 2XXX to provide an *F rating* for a time period at least equal to the *fire-resistance rating* of the floor assembly are permitted.

Add new standard to Chapter 35 as follows:

ASTM
E2XXX- Standard Test Method for Determining the Fire Resistance of Building Perimeter Containment Systems Due to External Spread of Fire

Reason: This proposal adds an additional alternative to the current IBC requirements for separation of openings in exterior walls. ASTM is currently working on the development of a Standard entitled "*Standard Test Method for Determining the Fire Resistance of Building Perimeter Containment Systems Due to External Spread of Fire*".

Justification: The new ASTM "leap-frog" standard is designed to evaluate the fire performance of an exterior wall assembly, with or without glazing, to prevent the spread of fire to the interior of the room above via fire spread from the exterior of a building by evaluating the building perimeter containment system, which includes the exterior curtain wall assembly and any glazing. The buildings perimeter containment system is a unique building construction detail not addressed by other fire test methods.

This test method is intended to simulate a possible fire exposure due to a post flashover compartment fire venting through an opening, onto the exterior building perimeter containment system. The fire exposure conditions in the test room are those specified by this test method for the first 30 min of exposure and then conform to the Test Methods E 119 time-temperature curve for the remainder of the test. This test method specifies the heating conditions, methods of test, and criteria for evaluation of the building perimeter containment system. Test results establish the performance of the perimeter containment system during the fire-exposure period and shall not be construed as having determined the suitability of a perimeter containment system for use after that exposure.

This test method evaluates the building perimeter containment system's ability to impede vertical fire spread to the interior of the room above via fire spread on the exterior of a building. In contrast, ASTM E2307 evaluates the ability of the perimeter fire barrier system to impede the vertical spread of fire from the floor of origin to the floor(s) above, via an interior fire spread.

Cost Impact: This proposal does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2XXX with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.8.5-FS-CRIMI

FS26 – 12
705.8.6, 705.8.6.1 (New), 705.8.6.2 (New)

Proponent: Homer Maiel, PE, CBO, Town of Atherton**,** representing self.

Revise as follows:

705.8.6 Vertical exposure. Opening protectives of buildings shall comply with this section.

705.8.6.1 Vertical exposure for buildings on the same lot. For buildings on the same lot, opening protectives having a *fire protection rating* of not less than 3/4 hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjacent building or structure based on assuming an imaginary line between them. The opening protectives are required where the *fire separation distance* between the imaginary line and the adjacent building or structure is less than 15 feet (4572 mm).

Exceptions:

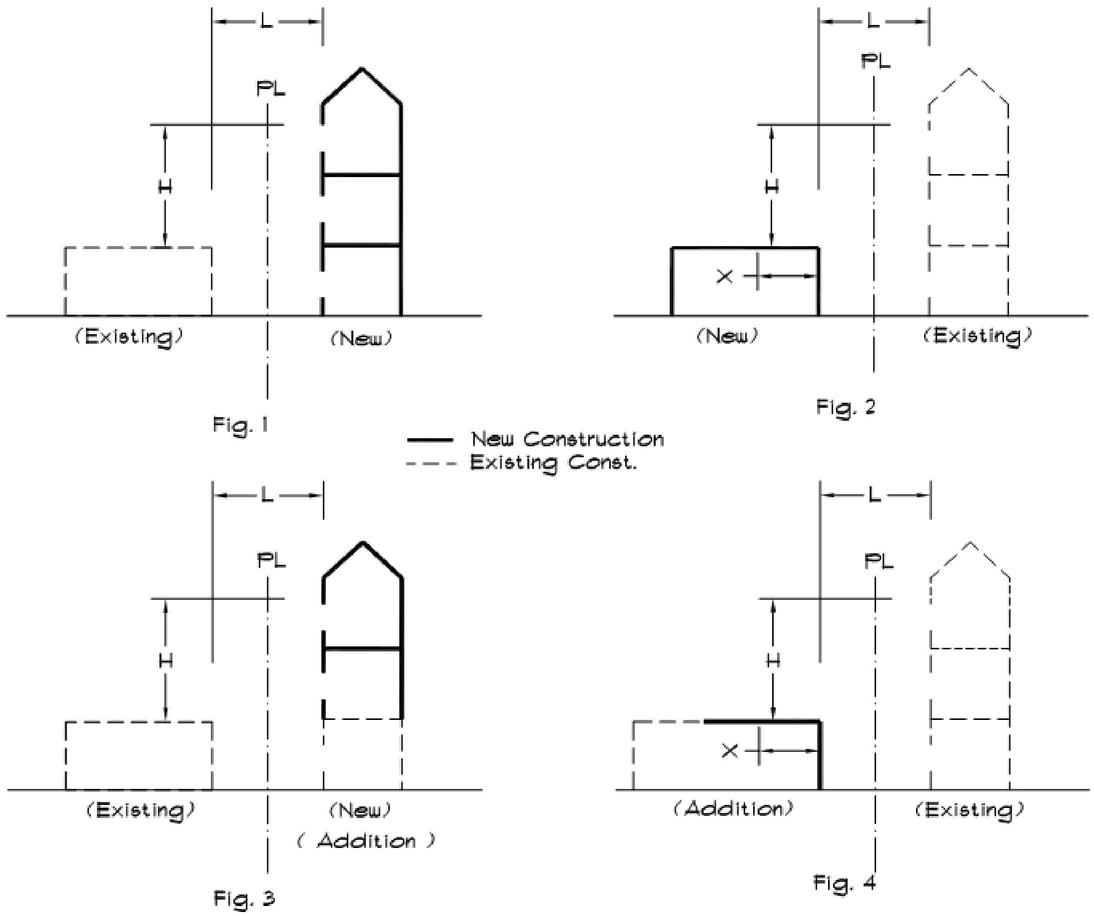
1. Opening protectives are not required where the roof assembly of the adjacent building or structure has a *fire-resistance rating* of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the *exterior wall* facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a *fire-resistance rating* of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with Section 705.8.6.1.

705.8.6.2 Vertical exposure for buildings on separate lots. When a new building or an addition is to be erected adjacent to an existing building, all openings in the exterior wall of the new building or addition are required to be not less than ¾ hour protectives when these openings are less than 15' vertically above the roof of existing building or structure. The opening protections are required where the distance between buildings or structures is less than 15' feet. When the roof of the new building or an addition is at lower elevation from the existing building, the roof construction of the new building or the addition shall have fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the existing building and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly shall have a fire-resistance rating of not less than 1 hour. The roof protections are required where the distance between the buildings or structures is less than 15' feet.

Reason: A fire in a lower building that is adjacent to a taller building can be a source of fire exposure to openings in the taller building. Since fire does not differentiate between buildings on same lot or separate adjacent lots, the existing provisions for buildings on the same lot need to be expanded to cover buildings on separate lots too. The requirements for the buildings on the separate lots should not be different from those on the same lot. The buildings on the same lots are under one ownership and the imaginary property lines can be moved so that it will serve all buildings in the most efficient way.

On the other hand, the buildings on separate lots are under different ownerships. The property lines are legal property lines and can not be moved around. An existing building on one site should not dictate the design and construction of the future building nor a future building should not alter the design and construction of an existing building. In other words, between two neighboring buildings, whichever is built last will need to comply with requirements of this section. The 15-foot separation requirement between buildings on the separate lots, is consistent with the same requirement for buildings on the same lot.

Also not to leave out the additions to existing buildings, additions are also included in these requirements. So for the sake of argument, imagine that there are two existing buildings, with same height, on separate lots. If one building is adding more stories, then these requirements could apply to the windows of new stories.



Cost Impact: The code change proposal will not increase the cost of construction.

FS26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.8.6-FS-MAIEL

FS27 – 12
706.2

Proponent: Edwin Huston represents National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

706.2 Structural stability. Firewalls shall be designed to meet the requirements of Chapter 16 under non-fire conditions. Fire walls shall be designed to have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for a lateral design wind load of 8 lb/ft^2 for the duration of time indicated by the required fire-resistance rating or shall be constructed as double fire walls in accordance with NFPA 221.

Reason: Section 706.2 is proposed for revision to provide a standard set of structural design requirements. Chapter 16 has requirements for structural walls, so a pointer to Chapter 16 is proposed. Without a specified wind design force, different jurisdictions have suggested different loading requirements to structural engineers. The 8 psf proposed is the current design load for interior partitions. It is the 5 psf load which has been used for many code cycles updated to a strength level load to agree with ASCE 7-10.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: FS22 and FS27 provide different requirements for fire wall structural stability. The committee needs to make its intent clear with respect to these provisions.

FS27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

706.2-FS-HUSTON

FS28 – 12

707.5, 707.5.1

Proponent: Philip Brazil, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

707.5 Continuity. *Fire barriers* shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such *fire barriers* shall be continuous through concealed space, such as the space above a suspended ceiling. Joints and voids at intersections shall comply with Sections 707.8 and 707.9.

Exceptions:

1. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
2. Interior exit stairway and ramp enclosures required by Section 1022.2 and exit access stairway and ramp enclosures required by Section 1009.3 shall be permitted to terminate at a top enclosure complying with Section 713.12.

707.5.1 Supporting construction. The supporting construction for a *fire barrier* shall be protected to afford the required *fire-resistance rating* of the *fire barrier* supported. Hollow vertical spaces within a *fire barrier* shall be fireblocked in accordance with Section 718.2 at every floor level.

Exceptions:

1. The maximum required *fire-resistance rating* for assemblies supporting *fire barriers* separating tank storage as provided for in Section 415.8.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.

~~2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.~~

2. Supporting construction for 1-hour *fire barriers* required by Table 509 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

~~4. Interior exit stairway and ramp enclosures required by Section 1022.2 and exit access stairway and ramp enclosures required by Section 1009.3 shall be permitted to terminate at a top enclosure complying with Section 713.12.~~

Reason: Exception 2 of Section 707.5.1 has been in the IBC since the 2000 edition (Section 706.5 for fire barriers) and, until the 2009 edition, had applied to the requirements in Sections 707.5 and 707.5.1, which were in a single Section 706.5 on continuity. Exception 2 of Section 706.5 in the 2006 edition (Section 706.4 in the 2000 and 2003 editions) is intended to apply to Section 707.5 of the 2009 and 2012 editions, which requires fire barriers to extend to the top of the underside of the floor or roof sheathing, slab or deck above. Proposal FS37-07/08-AMPC created a separate Section 707.5.1, which led to the incorrect placement of the exception in Section 707.5.1. Exception 4 of Section 707.5.1 is also relocated to Section 707.5 because the subject of the exception is similar to that of Exception 2.

Cost Impact: The code change proposal will not increase the cost of construction.

FS28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.5-FS-BRAZIL

FS29 – 12
707.6, 707.7.1, 717.5.2

Proponent: Philip Brazil, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

707.6 Openings. Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for exit access stairways and ramps, interior exit stairways and ramps, and exit passageways shall also comply with Sections 1009.3.1.4, ~~1022.3~~ 1022.4 and 1023.5, respectively.

(No change to Exceptions)

707.7.1 Prohibited penetrations. Penetrations into enclosures for *exit access stairways*~~, *exit access*~~ and *ramps*, *interior exit stairways*~~, *interior exit*~~ and *ramps*, ~~or an~~ and *exit passageway*s shall be allowed only ~~when~~ where permitted by Sections 1009.3.1.5, 1022.5 ~~or~~ and 1023.6, respectively.

717.5.2 Fire barriers. Ducts and air transfer openings of *fire barriers* shall be protected with *approved fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for *interior exit stairways*~~,~~ and *ramps*, and *exit passageways*, except as permitted by Sections ~~1022.4~~ 1022.5 and 1023.6, respectively.

(No change to Exceptions)

Reason: In Section 707.6, the addition of Section 1009.3.1.4 eliminates a technical error in that Proposal E5-09/10-AS expanded the scope of 2009 IBC Section 707.6 from exit enclosures and exit passageways to also include exit access stairways and exit access ramps. Section 1009.3.1.4 in the 2012 IBC corresponds to exit access stairways and exit access ramps in the same manner as Sections 1022.3 and 1023.5 correspond to exit enclosures and exit passageways, respectively, in the 2009 IBC. With the addition of Section 1009.3.1.4 in the proposal, the egress components are effectively placed into three groups so that they correspond to the three referenced sections. The change in the section reference from 1022.3 to 1022.4 restores the correlation in 2009 IBC Section 707.6 that referenced Section 1022.3 for openings, which is Section 1022.4 in the 2012 IBC.

The changes in Section 707.7.1 are primarily clarifying. The deletion of "exit access" and "interior exit" is done for consistency with "exit access stairways and ramps" and "interior exit stairways and ramps" in Section 707.6 and elsewhere in the 2012 IBC as established with the approved changes from Proposal E5-09/10-AS. The changes from "or" to "and" eliminate a technical error in that 2009 Section 707.7.1 contains two items and two corresponding section references but Proposal E5-09/10-AS revised the section to include five items and three section references, which do not correspond in the same manner. The additions in the proposal effectively place the egress components into three groups so that they correspond to the three referenced sections.

In Section 717.5.2, "interior exit" is added because Proposal E5-09/10-AS replaced "exit enclosures and exit passageways" with "enclosures for stairways, ramps and exit passageways" but exit access stairways and exit access ramps are required to be enclosed in accordance with Sections 1009.3 and 1010.2, respectively, and Sections 1022.5 and 1023.6 are limited in scope to interior exit stairways and ramps, and exit passageways, respectively. Without the addition of "interior exit," Section 717.5.2 would be more restrictive for exit access stairways and ramps than for interior exit stairways and ramps because of the penetrations of interior exit stairways and ramps, and exit passageways, by ducts and air transfer openings that are permitted by Sections 1022.5 and 1023.6, respectively, unless otherwise prohibited by Section 717.5.2. Note that 2012 IBC Section 1009.3.1.7 does not impose additional requirements on penetrations of exit access stairway enclosures other than by reference to Section 717. The change in the section reference from 1022.4 to 1022.5 restores the correlation in 2009 IBC Section 716.5.2 that referenced Section 1022.4 for penetrations, which is Section 1022.5 in the 2012 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

FS29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.6-FS-BRAZIL

FS30 – 12
707.9

Proponent: Tim Pate, City and County of Broomfield, Colorado, representing Colorado Chapter Code Change Committee

Revise as follows:

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a non-fire-resistance-rated roof assembly <u>or a non-fire-resistance – rated exterior wall assembly</u> shall be filled. An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

Reason: Section 707.9 is a new code section that deals with how to treat voids at top of fire barriers which terminate at non fire resistance rated roof assemblies. There is the same issue where fire barriers terminate at non fire resistance rated exterior walls. The added code language will clear up what to do with the void at these exterior walls which will match what to do at roof assembly.

Cost Impact:

FS30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.9-FS-PATE

FS31 – 12
707.9, 715.6 (New), 715.6.1 (New), Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a non-fire-resistance-rated roof assembly shall comply with Section 715. ~~be filled. An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~

715.6 Joints between fire resistance rated walls and non-fire resistance rated Floors or Roofs. Joints at the intersection of *fire barriers* with the underside of a non-fire resistance rated floor or roof sheathing, slab or deck above shall be protected by an approved continuity head of wall joint system installed as tested in accordance with ASTM E2837 and designed to resist the passage of fire for a time period not less than the required fire resistance rating of the wall in which it is installed.

715.6.1 Installation. Continuity head of wall joint systems shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

(Renumber subsequent section)

Add new standard to Chapter 35 as follows:

ASTM E 2837-11 *Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies*.

Reason: Chapter 7 of the IBC has numerous requirements for continuity of vertical and horizontal assemblies. In 2011 ASTM published its new ASTM Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies, ASTM E 2837-11. Referencing this Standard will help code enforcers and manufacturers by alleviate the need to use Engineering Judgements for many of these conditions.

Wall continuity is required by the IBC at joint openings, which are typically linear voids, gaps, openings, or other discontinuities within or at the junction of a rated wall assembly and nonrated horizontal assemblies, to ensure that the protected joint opening has the same fire resistance rating as the rated wall assembly and provides continuity to the underside of the roof, slab or deck.

Section 707.9 of the IBC requires the joint opening at the termination at the top of the rated fire barrier wall assembly below the nonrated horizontal assembly to be protected. The new ASTM E 2837 Standard evaluates continuity head-of-wall joint systems for this specific application. They are used in order to maintain continuity established by the rated wall assembly.

A continuity head-of-wall joint system is particular type of fire-resistive joint system that provides fire resistance to prevent passage of fire from compartment to compartment within the building at the joint opening between a rated wall assembly and a nonrated horizontal assembly. A continuity head-of-wall joint system is a unique building construction detail not addressed by other fire test methods such as Test Method E 1966 that tests joint systems installed between two assemblies that are fire resistance rated.

To achieve the F-Rating, the joint system must remains in the opening during the fire resistance test and the hose stream test, and will have withstood the fire resistance test for the rating period equal to the rated wall assembly by preventing flaming on the unexposed side of the test specimen and on the underside of the nonrated horizontal assembly on the unexposed side. The Integrity test also ensures no occurrence of ignition of the cotton pad, which is related to the passage of hot gases in the current IBC 707.9 requirements.

Cost Impact: This proposal should reduce affect the cost of construction

Analysis: FS31 and FS32 provide different requirements for the same joint condition (715.6). The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2837-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.9 #1-FS-CRIMI

FS32 – 12
707.9, 715.6 (New), Chapter 35

Proponent: John Valiulis, representing Hilti, Inc.(john.valiulis@hilti.com)

Revise as follows:

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a non-fire-resistance-rated roof assembly shall comply with Section 715. ~~be filled. An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~

715.6 Fire-Resistance rated wall/nonfire-resistance-rated floor or roof assembly intersections.. The voids created at the intersection of a fire-resistance rated vertical wall assembly and a non-fire-resistance-rated floor or roof assembly shall be installed and tested in accordance with ASTM E 2837 to prevent the passage of flame for the time period at least equal to the *fire-resistance rating* of the wall assembly and prevent the passage of heat and hot gases sufficient to ignite cotton waste.

Add new standard to Chapter 35 as follows:

ASTM E 2837-11 *Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies.*

Reason: Chapter 7 of the IBC has numerous requirements for continuity of vertical and horizontal assemblies. Wall continuity is required at joint openings, which are typically linear voids, gaps, openings, or other discontinuities within or intersecting rated wall assembly and nonrated horizontal assemblies, to ensure that the protected joint opening has the same fire resistance rating as the rated wall assembly. In 2011 ASTM published its new ASTM Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies, ASTM E 2837-11.

Section 707.9 of the IBC already requires the joint opening at the termination at the top of the rated fire barrier wall assembly below the nonrated horizontal assembly to be protected. The new ASTM E 2837 Standard evaluates continuity head-of-wall joint systems for this specific application. They are used in order to maintain continuity established by the rated wall assembly.

A continuity head-of-wall joint system is particular type of fire-resistive joint system that provides fire resistance to prevent passage of fire from compartment to compartment within the building at the joint opening between a rated wall assembly and a nonrated horizontal assembly. A continuity head-of-wall joint system is a unique building construction detail not addressed by other fire test methods such as Test Method E 1966 that tests joint systems installed between two assemblies that are fire resistance rated.

To achieve the F-Rating, the joint system must remains in the opening during the fire resistance test and the hose stream test, and will have withstood the fire resistance test for the rating period equal to the rated wall assembly by preventing flaming on the unexposed side of the test specimen and on the underside of the nonrated horizontal assembly on the unexposed side. The Integrity test also ensures no occurrence of ignition of the cotton pad, which is related to the passage of hot gases in the current IBC 707.9 requirements.

Cost Impact: This code change will not increase the cost of construction.

Analysis: FS31 and FS32 provide different requirements for the same joint condition (715.6). The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2837-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.9-FS-VALIULIS

FS33 – 12
707.9

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

~~**707.9 Voids at intersections.** The voids created at the intersection of a *fire barrier* and a non-fire-resistance-rated roof assembly shall be filled. An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~

Reason: This language is redundant. Section 707.8 already addresses this condition, and their is no differences between a "Void created at intersections" and Joints, which are defined as "The opening in or between adjacent assemblies...".

In the previous cycle, a Code change proposal was approved to 707.8 which clarified that the same requirement to protect the joint between a fire barrier and the underside of the floor also applies to the joint between a fire barrier and an exterior wall. The language in the 2012 IBC points the user to compliance with section 715. It is similar to the language in other sections of the IBC for voids created between rated and unrated assemblies.

Cost Impact: This code change will not increase the cost of construction.

Analysis: FS30 through FS32 provide revisions to Section 707.9. FS33 proposes deletion of the requirements. The committee needs to make its intent clear with respect to these provisions.

FS33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.9 #2-FS-CRIMI

FS34 – 12
708.1, 711.3

Proponent: Lee J. Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development (lkranz@bellevuewa.gov)

Revise as follows:

SECTION 708
FIRE PARTITIONS

708.1 General. The following wall assemblies shall comply with this section.

~~1.~~ ~~Walls separating *dwelling units* in the same building as required by Section 420.2.~~
~~2.~~ ~~Walls separating *sleeping units* in the same building as required by Section 420.2.~~
<u>1.</u> <u>Separation walls as required by Section 420.2 for Group I-1, R-1, R-2 and R-3.</u>
~~3~~2. Walls separating tenant spaces in *covered and open mall buildings* as required by Section 402.4.2.1.
~~4~~3. Corridor walls as required by Section 1018.1.
~~5~~4. Elevator lobby separation as required by Section 713.14.1.

SECTION 711
HORIZONTAL ASSEMBLIES

711.3 Fire-resistance rating. The *fire-resistance rating* of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a *fire-resistance rating* of not less than that required by Section 508.4 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different *fire areas*, the assembly shall have a *fire-resistance rating* of not less than that required by Section 707.3.10. ~~*Horizontal assemblies* separating *dwelling units* in the same building and *horizontal assemblies* separating *sleeping units* in the same building shall be a minimum of 1-hour fire-resistance-rated construction.~~ <u>*Horizontal assemblies* serving as *dwelling* or *sleeping unit* separations in accordance Section 420.3 shall be a minimum of 1-hour fire-resistance rated construction.</u>

> **Exception:** *Dwelling unit* and *sleeping unit* separations in buildings of Type IIB, IIIB and VB construction shall have *fire-resistance ratings* of not less than ½ hour in buildings equipped throughout with an approved *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason: This proposal creates consistency of Sections 708.1 and 711.3 with Sections 420.2 and 420.3 related to minimum fire resistance rating of vertical and horizontal assemblies.

This proposal creates consistency of Sections 708.1 and 711.3 with Sections 420.2 and 420.3 related to inclusion of "separation required for other occupancies contiguous to sleeping units and dwelling units in the same building".

Cost Impact: This code change proposal will not increase the cost of construction.

FS34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

708.1-FS-KRANZ

FS35 – 12
709.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

709.1 General. <u>Vertical and horizontal</u> *smoke barriers* shall comply with this section.

Reason: The purpose of this proposal is simply to clarify smoke barriers can be either horizontal or vertical. The issue has come up many times, and causes much confusion in the field. The definition of smoke barriers does currently identify that a smoke barrier is a continuous membrane, <u>either vertical or horizontal.</u> The definition goes on to list items such as a wall, floor or ceiling assembly, that is designed and constructed to restrict the movement of smoke.

Cost Impact: This change will reduce the cost of construction.

FS35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.1-FS-CRIMI

FS36 – 12
709.4

Proponent: Tim Pate, City and County of Broomfield, Colorado, representing self

Revise as follows:

709.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings <u>or exterior walls</u> that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 008.11.2 are not required to extend from outside wall to outside wall.
3. Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.

Reason: This added wording will clarify that when a smoke barrier extends to an exterior wall, the interstitial space will be required to provide resistance to the passage of fire and smoke equivalent to that provided by the smoke barrier which will match the requirement at an intersection of a ceiling.

Cost Impact: No cost increase – this proposal is attempting to clarify existing requirements by this added language.

FS36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.4-FS-PATE

FS37 – 12
709.4

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

709.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers used ~~for~~ to enclose elevator lobbies in accordance with Section 405.4.3, 1007.6.2, 3007.7.2 or 3008.7.2 shall be permitted to terminate at the elevator hoistway shaft enclosure. ~~not required to extend from outside wall to outside wall.~~ A smoke and draft control door assembly as specified in Section 716.5.3.1 shall not be required at each elevator hoistway door opening.
3. Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.

Reason: This proposal is one of several proposals submitted by the CTC dealing with elevator lobbies. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

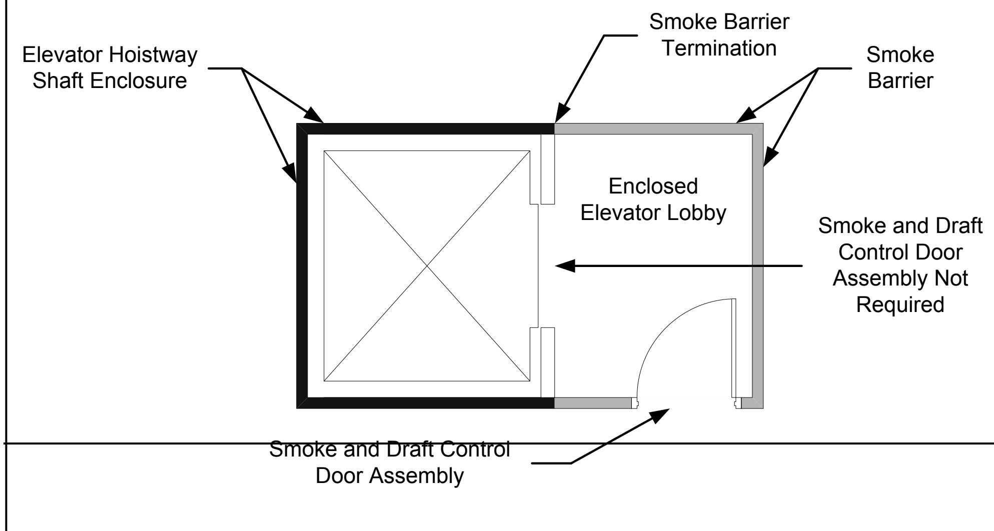
- ☐ Review the need for elevator lobbies,; with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- ☐ Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- ☐ Review related code provisions, such as egress from and through elevator lobbies.
- ☐ Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- ☐ Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- ☐ Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- ☐ Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

This proposal provides clarification of the smoke barrier continuity requirements. Provisions are necessary to clarify that opening protection at the hoistway opening is not necessary when an enclosed elevator lobby is provided in accordance with Section 405.4.3, 3007.7.2, or 3008.7.2. An enclosed elevator lobby protects the hoistway from smoke migration, therefore the hoistway is already protected. In addition the shaft walls provide sufficient smoke and draft protection to allow the smoke barriers to terminate at those walls.

This proposal does not require correlation with other CTC Elevator Lobby SG lobby proposals. See discussion on CTC elevator lobby proposal coordination in code change FS##-12



SEC 709.4, EXCEPTION 2 - SMOKE BARRIER TERMINATION AT ELEVATOR HOISTWAY SHAFT ENCLOSURE

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: FS37, FS38 and FS39 provide different requirements for smoke barriers enclosing elevator lobbies. The committee needs to make its intent clear with respect to these provisions.

FS37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.4-FS-Baldassarra-CTC

FS38 – 12
709.4

Proponent: Douglas H. Evans, P.E., Clark County Building, representing Southern Nevada Chapter ICC (DHE@ClarkCountyNV.gov)

Revise as follows:

709.4 Continuity. *Smoke barriers* shall form an effective membrane continuous ~~from outside wall to outside wall and~~ from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exception~~s~~:

~~1.~~ Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.

~~*2.* *Smoke barriers* used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 3008.11.2 are not required to extend from outside wall to outside wall.~~

~~*3.* *Smoke barriers* used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.~~

Reason: Requiring smoke barrier walls to be continuous from outside wall to outside wall can prove to be impractical in many applications. Many smoke control system employ passive smoke barriers as well as pressurization method zones that are wholly within a building where the smoke boundary walls do not intersect with the outside walls. The code requires smoke control systems for atria, underground buildings, Group I occupancies and covered malls. Requiring the smoke barrier wall to extend from outside wall to outside wall restricts the designer to certain parameters and limits the design of the building. In the instance of an atrium, if located within the center core of a building, requiring a fire-resistance rated separation to extend from outside wall to outside wall adds additional rated separations that are simply not needed when a smoke barrier wall around the atrium would meet the intent of the code by adequately separating the atrium from the balance of the facility. Underground buildings require compartmentation and therefore smoke barrier construction may be considered as redundant and unnecessary. Covered malls may be designed, and often are designed, as one large smoke zone, thereby eliminating the need for smoke barrier construction. The use of an outside wall is not required to make the system functional and provides no additional benefit.

Cost impact: None

Analysis: FS37, FS38 and FS39 provide different requirements for smoke barriers enclosing elevator lobbies. The committee needs to make its intent clear with respect to these provisions.

FS38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.4-FS-EVANS

FS39 – 12
709.4

Proponent: Dave Frable, representing U.S. General Services Administration, Public Buildings Service

Revise as follows:

709.4 Continuity. Smoke barriers shall form an effective membrane continuous ~~from outside wall to outside wall and~~ from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction for a smoke barrier shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction. Smoke barrier walls used to separate smoke compartments shall comply with Section 709.4.2. Smoke barrier walls used to enclose areas of refuge in accordance with Section 1007.6.2 or to enclose elevator lobbies in accordance with Section 405.4.3, 3007.7.2, or 3008.7.2 shall comply with Section 709.4.3.

Exception~~s~~:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. ~~Smoke barriers used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 3008.11.2 are not required to extend from outside wall to outside wall.~~
3. ~~Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.~~

709.4.2 Smoke barrier walls separating smoke compartments. Smoke barrier walls used to separate smoke compartments shall form an effective membrane continuous from outside wall to outside wall.

709.4.3 Smoke barrier walls enclosing areas of refuge or elevator lobbies. Smoke barrier walls used to enclose areas of areas of refuge in accordance with Section 1007.6.2, or elevator lobbies in accordance with Section 405.4.3, 3007.7.2, or 3008.7.2, shall form an effective membrane enclosure that terminates at a smoke barrier wall or fire barrier wall having a level of fire protection rating not less than 1-hour.

Reason: The intent of this code change proposal is to provide clarification to ensure that the area of refuge and the specific enclosed elevator lobbies are designed to minimize any potential intrusion of smoke. In addition, the proposed new text ensures that the termination wall of the smoke barrier will have a fire resistance rating equivalent to the fire resistance rating of the required smoke barrier. Also, the reference to sections 3007.4.2 and 3008.11.2 was also editorially corrected.

Cost Impact: This code change will not increase the cost of construction.

Analysis: FS37, FS38 and FS39 provide different requirements for smoke barriers enclosing elevator lobbies. The committee needs to make its intent clear with respect to these provisions.

FS39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.4-E-FRABLE

FS40 – 12
709.5, 709.5.1 (New)

Proponent: William E. Koffel, P.E., Koffel Associates, Inc. (wkoffel@koffel.com)

Revise as follows:

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 716.

Exceptions:

1. In Group I-2 and ambulatory care facilities, where ~~doors are installed across *corridors*,~~ a pair of opposite-swinging doors are installed across a corridor in accordance with Section 709.5.1, the doors shall not be required to be protected in accordance with Section 716. ~~without a center mullion shall be installed having have vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested.~~ The doors shall be close fitting within operational tolerances, and shall not have a center mullion or undercuts in excess of $^3/_4$-inch, louvers or grilles. The doors shall have head and jamb stops, and astragals or rabbets at meeting edges. ~~and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~ Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 716.

709.5.1 Group I-2 and ambulatory care facilities. In Group I-2 and ambulatory care facilities, where doors are installed across a corridor, the doors shall be automatic closing by smoke detection in accordance with Section 716.5.9.3 and shall have a vision panel with fire-protection rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested.

Reason: The first exception has been revised to clarify that it only applies when swinging doors are installed and does not require the use of swinging doors. Adding the second exception in the 2009 Edition helped with this issue but the proposed language is submitted for additional clarity.

The requirements for automatic closing doors and a vision panel have been removed from the first exception and added as a specific requirement. The Code should require the vision panel in both swinging and horizontal sliding doors. The purpose of the vision panel is to allow one to see if someone is in closing proximity to the door (applies only to swinging doors) and to allow the staff to check conditions on the other side of the door prior to opening the door. Both swinging doors and horizontal sliding doors, when installed across a corridor, are to be automatic-closing. Both of these requirements currently apply to such facilities due to licensure, certification, and accreditation requirements.

Cost Impact: None

FS40-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

709.5-FS-KOFFEL

FS41 – 12
404.6, 710.1, 710.5.2, 710.5.2.1, 710.5.2.2, 710.5.2.3, 713.14.1

Proponent: Joe Pierce, Dallas Fire Department, TX, representing the ICC Fire Code Action Committee

Revise as follows:

404.6 Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

> **Exception:** A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:
>
> 1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;
>   1.1. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
>   1.2. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic-closing <u>upon detection of smoke in accordance with Section 716.5.9.3</u>.
> 2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a 3/4-hour fire protection rating is provided.
> 3. A fire barrier is not required between the atrium and the adjoining spaces of any three floors of the atrium provided such spaces are accounted for in the design of the smoke control system.

Revise as follows:

SECTION 710
SMOKE PARTITIONS

710.1 General. ~~Smoke partitions installed as required elsewhere in the code shall comply with this section.~~ <u>The following wall assemblies shall comply with this section:</u>

1. <u>Walls separating atrium spaces as required by Section 404.6 Exception #1.</u>
2. <u>Group I-2 corridor walls as required by Section 407.3.</u>
3. <u>Group I-2 care suite separations as required by Section 407.4.3.2.</u>
4. <u>Elevator lobby walls as required by Section 713.14.1 Exception #5.</u>

~~**710.5.2 Doors.** Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.~~

710.5.2.~~1~~ Louvers <u>in Doors</u>. Doors in smoke partitions shall not include louvers.

~~**710.5.2.2 Smoke and draft control doors.** Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 m3/(s • m2)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.~~

~~**710.5.2.3 Self- or automatic-closing doors.** Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies; and
   4.3. Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. ~~In addition to the requirements in Section 710 for smoke partitions, doors~~ Doors protecting openings in the smoke partitions shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.5.9.3 and also comply with Section~~s 710.5.2.2~~ 716.5.3.1., ~~710.5.2.3, and 716.5.9 and duct~~ Duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

Reason: The intent of this proposal is to format the requirements for smoke partitions to clarify the application of the various features of smoke partitions.

Smoke partitions are required in only 4 sections of the code. Those sections are 404.6, 407.3, 407.4.3.2 and 713.14.1.

Section 710.1 is revised to list the 4 sections rather than state “elsewhere in the code” and then expect the code user to go find the sections.

Section 710.5.2.2 is deleted. Elevator lobbies are the only locations where smoke control doors are required. Since this is the only section where smoke control doors are required, rather than state “elsewhere in the code” it is clearer to revise Section 713.14.1 to contain the requirements and make reference directly to Section 716.5.9.3.

Section 710.5.2.3 is also deleted. Since doors in smoke partitions in elevator lobbies are handled in the revision to Section 713.4.1, there are only two sections which meet the “elsewhere in the code” criteria. The Sections are 404.6 and 407.3.1. Section 407.3.1 already makes the requirement for corridor walls in Group I-2. A minor revision to Section 404.6 and a reference directly to Section 716.5.9.3 covers the issue.

Within all of these revisions, the code requirements remain the same; the proposal does not change the current technical requirements in the code. Most importantly, Section 710 is simplified, and the occupancy or use specific requirements are located with other requirements for those occupancies and uses.

Section 710.3 was not revised since a smoke partition may be required to have a fire-resistance rating such as with a fire barrier or a horizontal assembly. In these cases, the design profession will need to comply with the other provisions in IBC Chapter 7 as well as the requirements for smoke partitions.

NOTE: The table below lists every subsection of 710 in the left column and the four locations where smoke partitions are required in the header. Each specific requirement is identified as either applying to those specific sections, or revisions are suggested to correlate the code requirements. The revisions shown in the table are the same revisions contained in this proposal, but you can see how each section was reviewed and evaluated.

Smoke Partition requirements in Section 710 with proposed revisions	**Where smoke partitions are required under the IBC**				**Comments**
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
710.1 General. ~~Smoke partitions installed as required elsewhere in the code shall comply with this section.~~ <u>The following wall assemblies shall comply with this section:</u> <u>1. Walls separating atrium spaces as required by Section 404.6 Exception #1</u> <u>2. Group I-2 corridor walls as required by Section 407.3.</u> <u>3. Group I-2 care suite separations as required by Section 407.4.3.2.</u> <u>4. Elevator lobby walls as required by Section 713.14.1 Exception #5.</u>	✓	✓	✓	✓	Revision Section 710.1 to identify where smoke partitions are used. This revision makes Section 710.1 user-friendly and clarifies where the 4 locations in the Code smoke partitions are required. Similar to existing Section 708.1 format that is for fire partitions.
710.2 Materials. The walls shall be of materials permitted by the building type of construction.	✓	✓	✓	✓	
710.3 Fire-resistance rating. Unless required elsewhere in the code, s partitions are not required to have a *fire-resistance rating*.	Non-fire rated	Non-fire rated	Non-fire rated	Non-fire rated	Smoke partitions are designed to resist the passage of smoke. If a wall that is a smoke partition is also required to be a fire partition or fire barrier, then it would need to comply with both requirements.
710.4 Continuity. Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.	✓	✓	✓	✓	

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
710.5 Openings. Openings in smoke partitions shall comply with Sections 710.5.1 and 710.5.2.	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	
710.5.1 Windows. Windows in smoke partitions shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke.	✓	✓	✓	✓	
~~**710.5.2 Doors.** Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.~~	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	Only a pointer section to requirements in following subsections	No longer needed since the requirements under Sections 710.5.2.2 & 710.5.2.3 are placed directly into the sections of Code that use these requirements. See Comments below.
710.5.2.~~1~~ Louvers <u>in Doors</u>. Doors in smoke partitions shall not include louvers.	✓	✓	✓	✓	Revised code section since Section 710.5.2 was not needed as a pointer if Sections 710.5.2.2 & 710.5.2.3 will be placed directly in the two places where the code requirements is actually required. See Comments below.

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
~~**710.5.2.2 Smoke and draft control doors.**~~ ~~Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 m3/(s • m2)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.~~	**Not Required**	**Not Required**	**Not Required**	✓ **713.14.1 Elevator lobby.** **Exceptions:** 5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. ~~In addition to the requirements in Section 710 for smoke partitions,~~ ~~d~~<u>D</u>oors protecting openings in the<u>se walls</u> ~~smoke partitions~~ shall <u>be self- or automatic-closing upon detection of smoke in accordance with Section 716.5.9.3 and</u> also comply with Section~~s 710.5.2.2~~ <u>716.5.3.1.</u>, ~~710.5.2.3, and 716.5.9 and~~ ~~d~~<u>D</u>uct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.	Since on the elevator lobby exception requires smoke control doors, directly reference this requirement in Section 713.14.1 Exception #5 to Section 716.5.3.1 that is the same wording and requirement for "opening protectives" In addition, instead of referencing Sections 710.5.2.3 and 716.5.9, go directly to the requirement for self or automatic closing doors in Section 716.5.9.3.

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
~~**710.5.2.3 Self- or automatic-closing doors.**~~ ~~Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~	✓ **404.6 Exceptions:** A *fire barrier* is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following: 1.2. Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic closing <u>upon detection of smoke in accordance with Section 716.5.9.3.</u>	**Not needed. Already covered by Section 407.3.1: 407.3.1 Corridor doors.** Corridor doors, other than those in a wall required to be rated by Section 509.4 or for the enclosure of a vertical opening or an exit, shall not have a required fire protection rating and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 716.5.	**Not Required**	✓ **See recommended revision to Exception #5 above and the comment.**	For the two places in the Code that require the self or automatic closing doors for its smoke partitions it is more user friendly and more direct just to incorporate the reference to Section 716.5.9.3 for the atrium and elevator exceptions then to go through Section 710.5.2.3 to get to Section 716.5.9.3.
710.6 Penetrations. The space around penetrating items shall be filled with an *approved* material to limit the free passage of smoke.	✓	✓	✓	✓	
710.7 Joints. Joints shall be filled with an *approved* material to limit the free passage of smoke.	✓	✓	✓	✓	

Smoke Partition requirements in Section 710 with proposed revisions	Where smoke partitions are required under the IBC				Comments
	404.6 Exception: For Atrium enclosure	**407.3: I-2 corridor wall construction**	**407.4.3.2: I-2 care suite separation**	**713.14.1 Exception #5: Elevator lobby**	
710.8 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an *approved* material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a *smoke damper* complying with Section 717.3.2.2. **Exception:** Where the installation of a *smoke damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.	✓	✓	✓	✓	

Cost Impact: The code change will not increase the cost of construction.

FS41-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

710-FS-PIERCE-FCAC

FS42 – 12
710.4

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

710.4 Continuity. Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke. <u>A lay-in ceiling system that is designed to limit the transfer of smoke shall be permitted. Hold-down clips for such ceilings shall not be required where the ceiling tiles will resist an uplifting force of at least one pound per square foot of tile.</u>

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

Current interpretation of an allowable ceiling system is to be "monolithic." This type of ceiling is not feasible in a hospital setting, because main utility and ductwork lines run in the corridor to keep them out of patient care areas. This would facilitate the need for many access panels which compromise the smoke tight nature of the monolithic ceiling. The construction of the lay-in system would basically mean no open portions or gaps in the ceiling, either as an architectural feature or between items such as louvers. Normal ceiling fixtures such as lights, sprinkler heads, and diffusers and grills (as part of a fully ducted air system) can be considered part of the smoke tight system, as there is no opportunity for smoke to travel straight through them. A tight fitting lay-in grid is defined as one with no gaps in them, which is easily enforced via visual inspection and is therefore simply maintained.

The one pound per square foot weight can handle an updraft concerns because a facility equipped with QRS sprinklers will not generate enough heat to cause the updraft to move the tile. Hold-down clips in this instance would not be necessary, as the weight of the tile itself would be sufficient. Due to the need for access to above ceiling utilities, hold-down clips would interfere with maintenance and operations, which is why an updraft limitation is considered.

Since a fully ducted air handling system is required in the I-2 hospital occupancy, plenum ceilings that compromise the ceiling system are already prohibited.

Cost Impact: The code change proposal will not increase the cost of construction.

FS42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

710.4-FS-Williams-AdHocHealthcare

FS43 – 12
710.5.2.2.1 (New)

Proponent: Jeff Inks, Window and Door Manufacturers Association, representing the National Architectural Door Council (jinks@wdma.com)

Revise as follows:

710.5.2.2.1 Smoke and draft control door labeling. Smoke and draft control doors complying only with UL 1784 shall be permitted to show the letter “S” on the manufacturer’s labeling.

Reason: Based upon feedback from manufacturers of smoke control and fire doors, there is inconsistent understanding in the field of what the use of the “S” letter marking on a door means and whether it is permitted to be used on doors that are not fire rated as required by Section 716.

Historically, the legacy codes, using the UBC as an example, only permitted the “S” letter marking to be used on doors that passed the air leakage portion (Part 2) of UBC 7-2 (1997). However, doors first had to pass Part 1 (Fire Endurance). Consequently only fire doors were allowed to bear the “S” letter mark.

The IBC contains no such requirement and is therefore silent on whether non-fire-rated doors, such as those allowed in smoke partitions, are permitted to bear the “S” letter mark. While the IBC requires rated fire doors that meet the requirements of UL 1784 to indicate that by including the “S” mark on the fire label, there is neither restriction nor requirement regarding the use of the “S” letter mark on non-fire-rated doors. It is also not unusual for design professionals to specify that the “S” letter mark be included by the manufacture on their labeling of non-rated smoke partition doors, but some manufacturers have been hesitant to do so because of the legacy code provisions.

This proposal helps clarifies that the use of the “S” letter mark is intended only to indicate conformance to UL 1784, and allows use of the marking on smoke partition doors that conform to that test standard.

Cost Impact: This will not increase the cost of construction.

FS43-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

710.5.2.2.1 (NEW)-FS-INKS

FS44 – 12

711.4.1, 712.1.17

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Delete without substitution:

~~**711.4.1 Nonfire-resistance-rated assemblies.** Joints in or between floor assemblies without a required fire-resistance rating shall comply with one of the following:~~

1. ~~The joint shall be concealed within the cavity of a wall.~~
2. ~~The joint shall be located above the ceiling.~~
3. ~~The joint shall be sealed, treated or covered with an approved material or system to resist the free passage of flame and the products of combustion.~~

~~**712.1.17 Nonfire-resistance-rated joints.** Joints in or between floors without a required fire-resistance rating shall be permitted in accordance with section 711.4.1.~~

(Renumber subsequent sections)

Reason: Section 711.4.1 is new to the 2012 Edition of the IBC. The provision was included as a portion of Item FS56-09/10 that was a relatively comprehensive reorganization of Chapter 7 vertical opening provisions. In its published reason statement, the proponent of FS56-09/10 stated, "Most of the changes proposed by the study group are editorial in nature and will not change how the code is applied or used." Our main proposal includes only amendments that this group feels are editorial or very minor changes."

The fact of the matter is that the proposal included substantial technical revisions without benefit of any justification or discussion. Section 711.4.1 is one such provision. Section 711 applies to "horizontal assemblies." The definition of horizontal assembly in Section 202 states, "A fire-resistance rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained." Section 711.1 states, "Floor and roof assemblies required to have a fire-resistance rating shall comply with this section." Additionally, it states, "Nonfire-resistance-rated floor and roof assemblies shall comply with Section 714.4.2." Section 714.4.2 provides for the protection of penetrations in non-fire-resistance-rated floor or roof assemblies.

Section 711.4.1 introduces new joint protection requirements for nonfire-resistance-rated floor assemblies where none previously existed. There was no technical justification for these more stringent provisions for non-rated construction. Additionally, there is no charging language to cause application of Section 711.4.1. Section 711.1 states that nonfire-resistance-rated floor and roof assemblies only need comply with Section 714.4.2, with no mention of Section 711.4.1. However, a new Section 712.1.17 does provide an off-handed allowance for joints in nonfire-resistive-rated floor assemblies that comply with Section 711.4.1.

The provisions of Section 711.4.1 are very severe in that they apply regardless of the number of connected stories. Inexplicably, fire protection requirements for non-rated construction continue to appear in the IBC without benefit of technical justification or statistical fire loss substantiation. The fact of the matter is that with only three exceptions (Groups B, F-2 and S-2), in unsprinklered buildings Table 601 only permits nonfire-resistance-rated floor construction in two story buildings. The IBC generally allows for two-story atmospheric communication, even in fire-resistance-rated types of construction.

Approval of this proposal will delete 2012 IBC Sections 711.4.1 and 712.1.17 and will return details of construction in nonfire-resistance-rated floor and roof assemblies to former levels that have proven to be appropriate based on the actual risk conditions as opposed to some unfounded hypothetical concern.

Cost Impact: None

FS44-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

711.4.1-FS-KEITH

FS45 – 12
711.5

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

711.5 Penetrations. Penetrations of horizontal assemblies~~, whether concealed or unconcealed,~~ shall comply with Section 714.

Reason: Section 711.5 was modified in the 2012 Edition of the IBC. The provision was included as a portion of Item FS56-09/10 that was a relatively comprehensive reorganization of Chapter 7 vertical opening provisions. In its published reason statement, the proponent of FS56-09/10 stated, “Most of the changes proposed by the study group are editorial in nature and will not change how the code is applied or used.” Our main proposal includes only amendments that this group feels are editorial or very minor changes.”

Although 2012 Section 711.5 has no marginal reference indicating a technical change from the 2009 Edition of the IBC, the fact of the matter is that FS56-09/10 included a substantial technical revision without any justification or discussion. That was, the qualification that Section 714 penetration protection requirements apply “whether the penetration is concealed or unconcealed.”

“Concealed” and “unconcealed” are terms that are neither defined in Section 202 nor used in technical context in Section 711, Horizontal Assemblies or Section 714, Penetrations. The terms will create confusion and lend to inconsistent interpretations of fundamental horizontal assembly penetration protection provisions. Some may argue that a penetration of a horizontal assembly occurring within a shaft enclosure is concealed, and therefore requires additional protection.

Section 714.4 currently adequately addresses horizontal assembly penetration conditions. The “through penetration” and “membrane penetration” concept has been in place for many IBC editions and is understood by code practitioners. There is no demonstrated need to further clarify these provisions. The 2012 language confuses the fundamental provisions.

Since there was no technical substantiation of this language as a portion of a code change represented as being editorial, it is unknown what is actually intended by this ambiguous terminology. As stated, it will create doubt and generate protection of construction features beyond those conditions currently addressed in the IBC.

Until Section 714.4 is rewritten to specifically address what concealed and unconcealed construction actually is and what is technical requirements potentially apply to these design conditions, the charging terminology should be removed from Section 711.5. It is certainly a subject area deserving of technical vetting that did not occur during the approval of FS56-09/10. Approval of this proposal will restore Section 711.5 to its former, understandable intent.

Cost Impact: None

FS45-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

711.5-FS-KEITH

FS46 – 12
711.8

Proponent: William E. Koffel, P.E., Koffel Associates, Inc. representing Bilco Company (wkoffel@koffel.com)

Revise as follows:

711.8 ~~Floor~~ Horizontal fire door assemblies. ~~Floor~~ Horizontal *fire door* assemblies used to protect openings in fire-resistance-rated ~~floors~~ horizontal assemblies shall be tested in accordance with NFPA 288, and shall achieve a *fire-resistance rating* not less than the assembly being penetrated. ~~Floor~~Horizontal *fire door* assemblies shall be labeled by an *approved agency*. The *label* shall be permanently affixed and shall specify the manufacturer, the test standard and the *fire-resistance rating*.

Reason: The Scope of NFPA 288, 2012 Edition has been expanded to include fire doors installed in fire-resistance rated horizontal assemblies, including fire resistance rated roof assemblies. The proposed change is consistent with the change in scope of NFPA 288

Cost Impact: None

FS46-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

712.8-FS-KOFFEL

FS47– 12
711.9

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

711.9 Smoke barrier. Where *horizontal assemblies* are required to resist the movement of smoke by other sections of this code in accordance with the definition of *smoke barrier*, penetrations and joints in such *horizontal assemblies* shall be protected as required for *smoke barriers* in accordance with Sections 714.5 and 715.6. ~~Regardless of the number of *stories* connected by elevator shaft enclosures,~~ doors located in elevator shaft enclosures that penetrate the *horizontal assembly* shall be protected <u>in accordance</u> ~~by enclosed elevator lobbies complying~~ with Section 713.14.1. Openings through *horizontal assemblies* shall be protected by shaft enclosures complying with Section 713. *Horizontal assemblies* shall not be allowed to have unprotected vertical openings.

Reason: The reason for this change is to clarify the code. This code changes addresses text new in the 2009 IBC. The new text creates in effect a hidden requirement for elevator lobbies. We are proposing to clearly direct user of the code to Section 713.14.1 for the scoping language for elevator lobbies, as well as construction methods and any exceptions.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

Cost Impact: None

Analysis: FS47 revises provisions for in elevator shaft enclosures. FS48 and FS49 delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS47-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

711.9-FS-Williams-Adhoc

FS48 – 12
711.9

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

711.9 Smoke barrier. Where *horizontal assemblies* are required to resist the movement of smoke by other sections of this code in accordance with the definition of *smoke barrier*, penetrations and joints in such *horizontal assemblies* shall be protected as required for *smoke barriers* in accordance with Sections 714.5 and 715.6. ~~Regardless of the number of *stories* connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the *horizontal assembly* shall be protected by enclosed elevator lobbies complying with Section 713.14.1.~~ Openings through *horizontal assemblies* shall be protected by shaft enclosures complying with Section 713. *Horizontal assemblies* shall not be allowed to have unprotected vertical openings.

Reason: This provision was added in the 2009 IBC under code change FS81-07/08. However, it is unclear if it overrides the exceptions of Section 713.14.1 associated with elevator lobbies.

The question that has to be asked is

“Do the Exceptions of Section 713.14.1 still apply?”

If the exceptions do not apply, then this one sentence overrules everything that has been built into the elevator lobby provisions over the past few years for occupancies with smoke barriers, such as I-2’s or ambulatory health care. And, no justification was presented.

Does this mean that:

1. all uses with a smoke barrier should not be allowed to exempt the ground floor from the elevator lobby provision of exception 1?
2. that the smoke partition option of exception 5 does not work?
3. that pressurization does not work?

If the exceptions do apply, then given that lobbies are only required when connecting more than 3 floors and with exception 4, the only buildings that this provision would apply to is:

1. two and three story non-sprinklered buildings with smoke barriers, and there shouldn’t be any; and,
2. two and three story Group I-2 buildings.

What justification has been presented to show that these buildings are a problem?

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: FS47 revises provisions for in elevator shaft enclosures. FS48 and FS49 delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

711.9-FS-GODWIN

FS49 – 12
711.9

Proponent: Sarah A. Rice, C.B.O., representing The Preview Group (srice@preview-group.com)

Revise as follows:

711.9 Smoke barrier. Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition of smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 709 ~~714.5 and 715.6. Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1. Openings through horizontal assemblies shall be protected by shaft enclosures complying with Section 713. Horizontal assemblies shall not be allowed to have unprotected vertical openings.~~

Reason: The current language of Section 711.9 contains provisions that are misplaced and are contradictory to other provisions in the IBC. In the Reason statement for the code change which brought this language into the code (FS81-07/08) the proponent states that "This code change proposal is intended to clarify the requirements for horizontal assemblies that are used to support smoke barrier walls such as in Group I-2 occupancies where smoke barriers are required to subdivide floors by Section 407.4." But Section 407.4 is NOT the only place in the code where smoke barriers are required, they are required also in Group I-3 occupancies.

When taken literally, the last 2 sentences totally negate the provisions found in Section 709; Smoke Barriers, and specifically the provisions found in Sections 709.5 through 709.8 which were developed to address openings, penetrations, joints and duct openings in smoke barriers – both vertical and horizontal. When looking at each of the individual sections, you find that there are multiple places where openings through horizontal assemblies are permitted to be protected by something other than a shaft enclosure.

This proposal seeks to remove the confusing language in Section 711.9 and rely rather on a simple reference to Section 709; Smoke Barriers which contains the provisions for addressing any "holes" made to smoke barriers.

2012 IBC 709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 716.

Exceptions:

1. In Group I-2 and ambulatory care facilities, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of 3/4-inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 716.

709.6 Penetrations. Penetrations of smoke barriers shall comply with Section 714.
709.7 Joints. Joints made in or between smoke barriers shall comply with Section 715.
709.8 Ducts and air transfer openings. Penetrations in a smoke barrier by ducts and air transfer openings shall comply with Section 717.

Noticeably absent from the proponents Reason statement was justification for the sentence "Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1." Due to the prolonged adoption of the 2009 I-Codes in many jurisdictions, it has only recently come to light the impact of this provision, which is buried deep in the horizontal assembly section. This provision, if it were to be deemed viable should not be in the Section 711 at all but in Section 713.4.1 Elevator Lobbies.

The provision buried in Section 711.9 mandates that "Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1." Depending upon how you read the sentence it could be interpreted to say that this provisions overrides the "more than three stories" threshold found in Section 713.4.1 for when an elevator lobby is required –

Section 713.4.1 reads: it reads "713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code."

No technical justification was ever given to validate changing the threshold found in Section 713.4.1 for elevator lobbies. This change deletes the provision from Section 711.9 in its entirety. The CTC Elevator Study Group has been studying the entire elevator lobby issue. Any drastic changes to the thresholds should come from that group.

For information purposes, the following is the Reason statement to FS81-07/08 “It is clear from the definition for “smoke barrier” that a smoke barrier can be a horizontal assembly. Furthermore, in order to provide for the continuity of the smoke protection for smoke compartments created by vertical smoke barriers to provide for relative safe areas for horizontal movement of patients in a fire emergency, it follows that the floors supporting those smoke barrier walls should also be able to resist the passage or movement of smoke through the assembly to maintain the appropriate level of protection for the occupants. Generally, occupants of Group I-2 occupancies are moved into a smoke barrier that is away from the area where the fire occurred so that they can remain until further moved as necessary or until the fire has been extinguished by the responding fire department. The provisions contained in this code change proposal we believe will provide the equivalent level of smoke protection to that of the smoke barrier for the horizontal assemblies that support the smoke barriers.”

Cost Impact: This proposal will not increase the cost of construction.

Analysis: FS47 revises provisions for in elevator shaft enclosures. FS48 and FS49 delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

711.9-FS-RICE

FS50 – 12
711, 712, 713, 714

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 711
FLOOR AND ROOF ASSEMBLIES ~~HORIZONTAL ASSEMBLIES~~

711.1 General. ~~Floor and roof assemblies required to have a fire-resistance rating~~ Horizontal assemblies shall comply with Section 711.2 ~~this section~~. Nonfire-resistance-rated floor and roof assemblies shall comply with Section 711.3 ~~714.4.2~~.

711.2 Horizontal assemblies. Horizontal assemblies shall comply with Sections 711.2.1 through 711.2.6.

711.2.1 ~~711.2~~ Materials. ~~The floor and roof~~ Assemblies shall be of materials permitted by the building type of construction.

711.2.2 ~~711.4~~ Continuity. Assemblies shall be continuous without vertical openings, ~~penetrations or joints~~ except as permitted by this section and Section~~s~~ 712.~~2, 714.4, 715, 1009.3 and 1022.1~~. ~~Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 705.8.6.~~ The supporting construction shall be protected to afford the required *fireresistance rating* of the *horizontal assembly* supported.

> **Exception:** In buildings of Type IIB, IIIB or VB construction, the construction supporting the *horizontal assembly* is not required to be fire-resistance-rated at the following:
>
> 1. Horizontal assemblies at the separations of incidental uses as specified by Table 509, provided the required *fire-resistance rating* does not exceed 1 hour.
> 2. Horizontal assemblies at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.
> 3. Horizontal assemblies at *smoke barriers* constructed in accordance with Section 709.

711.2.3 Supporting construction. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

> **Exception:** In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance-rated at the following:
>
> 1. Horizontal assemblies at the separations of incidental uses as specified by Table 509 provided the required fire-resistance rating does not exceed 1 hour.
> 2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 420.3.
> 3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

711.2.4 ~~711.3~~ Fire-resistance rating. The fire-resistance rating of ~~floor and roof~~ horizontal assemblies shall comply with Sections 711.2.4.1 through 711.2.4.6 but shall not be less than that required by the building type of construction.

711.2.4.1 Separating mixed occupancies. Where the ~~floor~~ horizontal assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.4 based on the occupancies being separated.

711.2.4.2 Separating fire areas. Where the ~~floor~~ horizontal assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 707.3.10.

711.2.4.3 Dwelling units and sleeping units. Where the horizontal assemblies separating dwelling units in the same building ~~and horizontal assemblies separating~~, or sleeping units in the same building, the assembly shall be a minimum of 1-hour fire-resistance-rated construction.

> **Exception:** Horizontal assemblies separating dwelling units and sleeping units shall be a minimum of ½ hour fire-resistance-rated construction ~~separations~~ in a building~~s~~ of Type IIB, IIIB and VB construction, ~~shall have fire-resistance ratings of not less than 1/2 hour in~~ when the building~~s~~ is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

711.2.4.4 Separating smoke compartments. Where the horizontal assembly is required to be a smoke barrier, the assembly shall comply with Section 709.

711.2.4.5 Separating incidental uses. Where the horizontal assembly separates incidental uses from the remainder of the building, the assembly shall have a fire-resistance rating of not less than that required by Section 509.

711.2.4.6 Other separations. Where a horizontal assembly is required by other sections of this code, it shall have a fire-resistance rating of not less than that required by that section.

711.2.5 ~~711.3.1~~ Ceiling panels. Where the weight of lay-in ceiling panels, where used as part of fire-resistance-rated floor/ceiling or roof/ceiling assemblies, is not adequate to resist an upward force of 1 pound per square foot (48 Pa), wire or other approved devices shall be installed above the panels to prevent vertical displacement under such upward force.

711.2.6 ~~711.3.3~~ Unusable space. In 1-hour fire-resistance-rated floor/ceiling assemblies, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof assemblies, the floor membrane is not required to be installed where unusable attic space occurs above.

711.3 Nonfire-resistance rated floor and roof assemblies. Nonfire-resistance rated floor, floor/ceiling, roof and roof/ceiling assemblies shall comply with Sections 711.3.1 and 711.3.2.

711.3.1 Materials. Assemblies shall be of materials permitted by the building type of construction.

711.3.2 Continuity. Assemblies shall be continuous without vertical openings, except as permitted by Section 712.

~~**711.5 Penetrations.** Penetrations of horizontal assemblies, whether concealed or unconcealed, shall comply with Section 714.~~

~~**711.7 Ducts and air transfer openings.** Penetrations in horizontal assemblies by ducts and air transfer openings shall comply with Section 717.~~

~~**711.9 Smoke barrier.** Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition of smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 714.5 and 715.6. Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1. Openings through horizontal assemblies shall be~~

~~protected by shaft enclosures complying with Section 713. Horizontal assemblies shall not be allowed to have unprotected vertical openings.~~

SECTION 712
VERTICAL OPENINGS

712.1 General. ~~The provisions of this section shall apply to the~~ <u>Each</u> vertical opening ~~applications~~ ~~listed~~ <u>shall comply with one of the protection methods</u> in Sections 712.1.1through 712.1.16~~8~~.

712.1.1 Shaft enclosures. Vertical openings contained entirely within a shaft enclosure complying with Section 713 shall be permitted.

712.1.2 Individual dwelling unit. Unconcealed vertical openings totally within an individual residential dwelling unit and connecting four stories or less shall be permitted.

712.1.3 Escalator openings. Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, <u>vertical openings for</u> ~~an~~ escalator<u>s</u> ~~opening~~ shall be <u>permitted when</u> protected according to Section 712.1.3.1 or 712.1.3.2.

712.1.3.1 Opening size. Protection by a draft curtain and closely spaced sprinklers in accordance with NFPA 13 shall be permitted where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the escalator. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.

712.1.3.2 Automatic shutters. Protection of the <u>vertical</u> opening by approved shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.

712.1.4 Penetrations. Penetrations, <u>concealed and unconcealed,</u> shall be <u>permitted where</u> protected in accordance with Section 714.

<u>**712.1.5 Joints.** Joints shall be permitted where complying with Section 712.1.5.1 or 712.1.5.2, as applicable</u>.

<u>**712.1.5.1**</u> ~~**711.6**~~ **Joints** <u>**in or between horizontal assemblies.**</u> Joints made in or between horizontal assemblies shall comply with Section 715. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be <u>permitted when</u> protected in accordance with Section 715.4.

<u>**712.1.5.2**</u> ~~**711.4.1**~~ <u>**Joints in or between**</u> **nonfire-resistance-rated** <u>**floor**</u> **assemblies.** Joints in or between floors without a required *fire-resistance rating* shall <u>be permitted</u> when they comply with one of the following:

1. The joint shall be concealed within the cavity of a wall.
2. The Joint shall be located above a ceiling.
3. The joint shall be sealed, treated or covered with an approved material or system to resist the free passage of flame and the products of combustion.

   Exception: Joints meeting one of the ~~joint~~ exceptions listed in Section 715.1.

712.1.6 ~~**712.1.5**~~ **Ducts and air transfer openings.** Penetrations by ducts and air transfer openings shall be protected in accordance with Section 717~~.6~~. Grease ducts shall be protected in accordance with the *International Mechanical Code*.

712.1.7 ~~**712.1.6**~~ **Atriums.** In other than Group H occupancies, atriums complying with Section 404 shall be permitted.

712.1.8 ~~**712.1.7**~~ **Masonry chimney.** Approved vertical openings for masonry chimneys shall be permitted where the annular space is fireblocked at each floor level in accordance with Section 718.2.5.

712.1.9 ~~**712.1.8**~~ **Two-story openings.** In other than Groups I-2 and I-3, a ~~floor~~ vertical opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

712.1.10 ~~**712.1.9**~~ **Parking garages.** Vertical openings in parking garages for automobile ramps, elevators and duct systems shall comply with Section 712.1.10.1, 712.1.10.2 or 712.1.10.3 as applicable.
NOTE: Editorial

712.1.10.1 Automobile ramps. Vertical openings for automobile ramps in open and enclosed parking garages shall be permitted where constructed in accordance with Sections 406.5 and 406.6, respectively.

712.1.10.2 ~~**712.1.15**~~ **Elevators** ~~**in parking garages.**~~ Vertical openings for elevator hoistways in open or enclosed parking garages that serve only the parking garage, and complying with Sections 406.5 and 406.6 respectively, shall be permitted.

712.1.10.3 ~~**712.1.16**~~ **Duct systems** ~~**in parking garages.**~~ Vertical openings for mechanical exhaust or supply duct systems in open or enclosed parking garages complying with Sections 406.5 and 406.6 respectively, shall be permitted to be unenclosed where such duct system is contained within and serves only the parking garage.

712.1.11 ~~**712.1.10**~~ **Mezzanine.** Vertical openings between a mezzanine complying with Section 505 and the floor below shall be permitted.

~~**712.1.11 Joints.** Joints shall be permitted where complying with Section 715.~~

712.1.12 Unenclosed stairs and ramps. Vertical ~~floor~~ openings created by unenclosed stairs or ramps in accordance with Sections 1009.2 and 1009.3 shall be permitted.

712.1.13 Openings. ~~**Floor fire doors.**~~ Vertical openings for floor fire doors and access doors shall be permitted where protected by Section 712.1.13.1 or Section 712.1.13.2 as applicable. ~~floor fire doors in accordance with Section 711.8~~.

712.1.13.1 ~~**711.8**~~ **Floor fire door assemblies.** Floor fire door assemblies used to protect openings in fire-resistance-rated floors shall be tested in accordance with NFPA 288, and shall achieve a fire-resistance rating not less than the assembly being penetrated. Floor fire door assemblies shall be labeled by an approved agency. The label shall be permanently affixed and shall specify the manufacturer, the test standard and the fire-resistance rating.

712.1.13.2 ~~711.3.2~~ Access doors. Access doors shall be permitted in ceilings of fire-resistance-rated floor/ceiling and roof/ceiling assemblies provided such doors are tested in accordance with ASTM E 119 or UL 263 as horizontal assemblies and labeled by an approved agency for such purpose.

712.1.14. Group I-3. In Group I-3 occupancies, vertical openings shall be permitted in accordance with Section 408.5.

~~**712.1.17 Nonfire-resistance-rated joints.** Joints in or between floors without a required *fire-resistance rating* shall be permitted in accordance with Section 711.4.1.~~

712.1.15 Skylights. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 705.8.5. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

712.1.16 ~~712.1.18~~ Openings otherwise permitted. Vertical openings shall be permitted where allowed by other sections of this code.

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure has an opening ~~connects more than three stories~~ . The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions , doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. In other than Group I-2 or I-3 occupancies, an enclosed elevator lobby shall not be required where an elevator shaft enclosure connects not more than three stories.
2~~1~~ Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3~~2~~. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
4~~3~~. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
5~~4~~. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   5.1~~4.1.~~ Group I-2 occupancies;
   5.2~~4.2~~. Group I-3 occupancies; and
   5.3~~4.3~~. Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.
6~~5~~. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also

comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.

7~~6~~. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.

8~~7~~. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

714.4 Horizontal assemblies. Penetrations of a fire-resistance rated ~~-~~floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 712.1 shall be protected in accordance with Sections 714.4.1 through 714.4.4 ~~714.4.2.2~~.

~~**714.4.1 Fire-resistance-rated assemblies.** Penetrations of the fire-resistance-rated floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall comply with Sections 714.4.1.1 through 714.4.1.4. Penetrations in horizontal smoke barriers shall also comply with 714.5.~~

714.4.1 ~~714.4.1.1~~ Through penetrations. Through penetrations of ~~fire-resistance-rated~~ horizontal assemblies shall comply with Section 714.4.1.1 or 714.4.1.2 ~~714.4.1.1.1 or 714.4.1.1.2~~.
(exceptions to remain unchanged)

714.4.1.1 ~~714.4.1.1.1~~ Installation. Through penetrations shall be installed as tested in the approved fire-resistance-rated assembly.

714.4.1.2 ~~714.4.1.1.2~~ Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating.

714.4.2 ~~714.4.1.2~~ Membrane penetrations. Penetrations of membranes that are part of a horizontal assembly shall comply with Section 714.4.1.1 or 714.4.1.2 ~~714.4.1.1.1 or 714.4.1.1.2~~. Where floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

(Potions of text not shown remain unchanged)

714.4.3 ~~714.4.1.3~~ Dissimilar materials. Noncombustible penetrating items shall not connect to combustible materials beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the horizontal assembly is maintained.

714.4.4 ~~714.5~~ Penetrations in smoke barriers. Penetrations in *smoke barriers* shall be protected by an approved *through-penetration firestop system* installed and tested in accordance with the requirements of UL 1479 for air leakage. The *L rating* of the system measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed**:**

1. 5.0 cfm per square foot (0.025m3 / s · m2) of penetration opening for each *through-penetration firestop system*; or
2. A total cumulative leakage of 50 cfm (0.024m3/s) for any 100 square feet (9.3 m2) of wall area, or floor area.

<u>714.5</u> ~~714.4.2~~ Nonfire-resistance-rated assemblies. Penetrations of nonfire-resistance-rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance-rated roof/ceiling assembly shall meet the requirements of Section 713, or shall comply with Section <u>714.5.1 or 714.5.2</u> ~~714.4.2.1 or 714.4.2.2~~.

<u>714.5.1</u> ~~714.4.2.1~~ Noncombustible penetrating items. Noncombustible penetrating items that connect not more than five stories are permitted, provided that the annular space is filled to resist the free passage of flame and the products of combustion with an approved noncombustible material or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

<u>714.5.2</u> ~~714.4.2.2~~ Penetrating items. Penetrating items that connect not more than two stories are permitted, provided that the annular space is filled with an approved material to resist the free passage of flame and the products of combustion.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/CTC/Pages/default.aspx. Since its inception in April/2005, the CTC has held twenty two meetings - all open to the public.

This proposed change is a result of the CTC's investigation of vertical openings through the Vertical Opening Study Group, which is part of the area of study, entitled "Balanced Fire Protection." The scope of the activity is noted as:

"To investigate what constitutes an acceptable balance between active fire protection and passive fire protection measures with respect to meeting the fire and life safety objectives of the IBC."

This proposal reorganizes some sections of Chapter 7 in order to clarify the provisions for protection of vertical openings. In the last code cycle, FS56-09/10 removed some inconsistencies, conflicts and obsolete language in Chapter 7, and eliminated some "do loops" that sent the code user in circles. This code change continues to take the code in the direction established by FS56. As with FS56-09/10, these proposed changes are editorial in nature and will not change how the code is applied. The primary change is to distinguish the different functions of Sections 711 and 712. Section 711 will contain only provisions for construction of horizontal assemblies and floor assemblies; Section 712 will contain all the initial provisions for vertical openings. In the 2012 IBC, Section 711 has a mixture of provisions related to assembly construction and to protection of vertical openings. In this proposal, all those provisions related to vertical openings are relocated to Section 712.

This proposal corrects an inconsistency in Section 711 with regard to non-rated floor and roof assemblies. The charging language in Section 711.1 of the 2012 code says that only rated horizontal assemblies are required to comply with Section 711; non-rated floor and roof assemblies are required to comply only with Section 714.4.2. However, Section 711.4.1 is titled "nonfire-resistance-rated assemblies" and contains provisions that are meant to apply to non-rated assemblies. This proposal corrects that anomaly by dividing Section 711 into separate subsections for rated and nonrated assemblies, and revising Section 711.1 to state that non-rated assemblies are required to comply with 711.3.

The specific changes include the following.
<u>Sec. 711.1</u>: The charging language is revised to clarify that rated assemblies are required to comply with Section 711.2 ("Horizontal assembly" is defined in Chapter 2 as "a fire-resistance-rated floor or roof assembly …"). Nonrated assemblies are required to comply with Section 711.3.
<u>Sec. 711.2</u>: A new subsection is created that applies only to rated horizontal assemblies. The provisions of Section 711.3 through 711.3.2 are separated into subsections with no change to the requirements. New subsections 711.2.4.4, 711.2.4.5 and 711.2.4.6 are added so that all the requirements for fire-resistance rating of horizontal assemblies are included in 711.
<u>711.2.2 & 711.2.3</u>: The language currently found in Section 711.4, Continuity, is moved closer to the beginning of the section and divided into two subsections to draw attention to the fact that the two provisions deal with separate subjects.
<u>711.3.2 (2012 IBC):</u> This section is being moved to Section 712 (712.1.13) because it applies to a vertical opening rather than a horizontal or floor assembly.
<u>711.3:</u> A new subsection is created that includes basic provisions for non-rated assemblies.
<u>Sec. 711.4 (2012 IBC)</u>: The first sentence is relocated to new Section 711.2.1. The sentence that addresses skylights is moved to Section 712 (712.1.15) because it applies to a vertical opening rather than a horizontal or floor assembly. The last sentence and the exception are relocated to new Section 711.2.3.
<u>Secs 711.5-711.8</u>: All these sections pertain to protection of vertical openings and are relocated to Section 712.
<u>Sec. 711.9</u>: The provisions related to elevator lobbies are moved to Section 713.14 except the last sentence which is deleted because it is covered by Section 712.
<u>Sec. 712.1</u>: The charging language is revised to state more clearly that all vertical openings are required to be protected with one of the methods described in Section 712.
<u>Sec. 712.1.5</u>: 2012 Section 711.4.1 is relocated to 712 because it pertains to protection of vertical openings.
<u>Sec. 712.1.10</u>: The provisions related to vertical openings in parking garages are collected in this section. 712.1.10.1 is taken from current Sec. 712.1.9; 712.1.10.2 is taken from current Sec. 714.1.15; and 712.1.10.3 is taken from current Sec. 712.1.16.
<u>Sec. 712.1.11</u>: The current section moved to Section 712.1.5.
<u>Sec. 712.1.13</u>: Provisions related to opening protectives are collected together in new subsections. Sec. 712.1.13.1 relocated the provisions for floor fire door assemblies from current Sec. 711.8; Sec. 712.1.13.2 is relocated from current Sec. 711.3.2.
<u>Sec. 712.1.15</u>: A portion of current Sec. 711.4 is relocated here.

Sec. 713.14.1: This section is revised to accommodate provisions currently found in Section 711.9. Lobbies will still be required in most buildings only if there are more than 3 stories. However, the 3-story limitation is moved to an exception in order to incorporate the provision from 711.9 that requires lobbies whenever an elevator penetrates a smoke barrier. The exception mentions Group I-2 and I-3 occupancies because that is where smoke barriers are used.
Sec. 714.4: Sec. 714.4 is separated into separate sections for horizontal assemblies and non-rated assemblies.

Cost Impact: This code change proposal will not increase the cost of construction.

FS50-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

711-FS-BALDASSARRA-CTC

FS51 – 12
712.1.8, 1009.3

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

712.1.8 Two-story openings. In other than Groups I-2 and I-3, a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two <u>adjacent</u> stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

1009.3 Exit access stairways. Floor openings between stories created by exit access stairways shall be enclosed.

Exceptions:

1. In other than I-2 and I-3 occupancies, *exit access stairways* that serve, or atmospherically communicate between, only two <u>adjacent</u> stories are not required to be enclosed.
2. Exit access stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
3. In buildings with only Group B or M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
4. In other than Group B and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.

Reason: Section 712.1.8: As written, it would allow a multi-story shaft with an opening at the bottom floor and at the top floor, but not the intermediate floors. While the shaft is only open to two stories, it creates a multi-story shortcut.

Section 1009.3: As written, the phrase "atmospherically communicate" would allow a multi-story shaft with an opening at the bottom floor and at the top floor, but not the intermediate floors. While the shaft is only open to two stories, it creates a multi-story shortcut.

Cost Impact: This code change proposal will not increase the cost of construction.

FS51-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

712.1.8-FS-GODWIN

FS52 – 12
707.5.1, 713.1, 909.20

Proponent: Philip Brazil, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

707.5.1 Supporting construction. The supporting construction for a *fire barrier* shall be protected to afford the required *fire-resistance rating* of the *fire barrier* supported. Hollow vertical spaces within a *fire barrier* shall be fireblocked in accordance with Section 718.2 at every floor level.

Exceptions:

1. The maximum required *fire-resistance rating* for assemblies supporting a *fire barrier* separating tank storage as provided in Section 415.8.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
3. Supporting construction for 1-hour *fire barriers* required by Table 509 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.
4. Interior exit stairway and ramp enclosures required by Section ~~1022.2~~ <u>1009.2.2</u> and exit access stairway and ramp enclosures required by Section 1009.3 shall be permitted to terminate at a top enclosure complying with Section 713.12.

713.1 General. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Exit access stairways and exit access ramps shall be ~~protected~~ <u>enclosed</u> in accordance with the ~~applicable provisions of~~ Sections 1009<u>.3 and 1010.2, respectively</u>. Interior exit stairways and interior exit ramps shall be ~~protected~~ <u>enclosed</u> in accordance with ~~the requirements of~~ Section ~~1022~~ <u>1009.2.2</u>.

Revise as follows:

909.20 Smokeproof enclosures. Where required by Section 1022.10, a *smokeproof enclosure* shall be constructed in accordance with this section. A *smokeproof enclosure* shall consist of an ~~enclosed~~ *interior exit stairway* that ~~conforms to~~ <u>is enclosed in accordance with the applicable provisions of</u> Section ~~1022.2~~ <u>1022</u> and an open exterior balcony or ventilated vestibule meeting the requirements of this section. Where access to the roof is required by the *International Fire Code*, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

Reason: The changes are made because Sections 1009.2.2 and 1010.2 require the enclosure of interior exit stairways and ramps, respectively. Section 1022, however, does not require their enclosure but does specify the technical provisions for their enclosure (e.g., Sections 1022.2, 1022.4, 1022.5 and 1022.7). The changes in Section 909.20 are also being made for consistency with similar language in Section 1010.2. Based on our analysis of the 2012 IBC, all references to the enclosure of interior exit stairways and ramps where similar changes are warranted are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

FS52-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.5.1-FS-BRAZIL

FS53 – 12
713.4

Proponent: Barry Gupton, PE, NC Department of Insurance, Office of State Fire Marshal, Engineering Division (barry.gupton@ncdoi.gov)

Revise as follows:

713.4 Fire-resistance rating. Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1-hour where connecting less than four stories. The number of stories connected by the shaft enclosure shall include any basements but not any mezzanines. ~~Shaft enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.~~ Where a shaft enclosure connects less than four stories and penetrates floor assemblies rated for 2 hours or more the shaft enclosure shall have a fire-resistance rating of 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1.

Reason: This is an editing correction to help clarify the intent of the code. The existing sentence concerning the penetration of rated floor assemblies is confusing and appears to contradict the beginning of the section. The intent is that the floor rating supersede the rating based on the number of connected floors if the floor assembly is rated greater than would be required by the number of floors connected. That only happens when you have a 2-hour or more rated floor assembly and less than 4 connected floors.

Cost Impact: The code change proposal will not increase the cost of construction.

FS53-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.4-FS-GUPTON

FS54 – 12
713.8

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

713.8 Penetrations. Penetrations in a shaft enclosure shall be protected in accordance with Section 714 as required for *fire barriers*. Structural elements, such as beams or joists, where protected in accordance with Section 714 shall be permitted to penetrate a shaft enclosure <u>provided the materials and methods of construction used to protect penetrations are designed to accommodate anticipated deflection of the structural elements under fire exposure.</u>

Reason: In the last cycle, the IBC was revised to permit beams and other structural elements to penetrate a fire separation as long as the structural element is also protected. While this intent may be reasonable, special precautions must be taken to ensure that the methods and materials used to protect the through penetrations are designed to accommodate the deflection anticipated during tests of fire resistance rated assemblies or structural elements. Through penetration fire stop system used as described in 713.8 need to be designed to anticipate this level of deflection.

The 2011 edition of ASTM E119 now imposes maximum deflection criterion for evaluation of unrestrained beams for fire resistance rated horizontal assemblies. The maximum total deflection permitted is dependent upon the clear span of the beam, and the distance between the extreme fiber of the beam in the compression and tensile zones. Other fire-resistance rated structural members do not include limits on maximum deflection or deflection rate. Even under non-fire conditions, the Code permits a prescribed maximum deflection.

Deflections of 6 to 8 inches are not uncommon when conducting fire-resistance tests on load-bearing structural elements or assemblies. Consequently, this proposal requires designers to take into account anticipated deflections when structural elements penetrate a shaft.

Cost Impact: This proposal does not increase the cost of construction.

FS54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.8-FS-CRIMI

FS55 – 12
713.11

Proponent: Sharon S. Gilyeat, Koffel Associates, Inc., representing CHUTES International

Revise as follows:

713.11 Enclosure at the bottom. Shafts that do not extend to the bottom of the building or structure shall comply with one of the following:

1. They shall be enclosed at the lowest level with construction of the same *fire-resistance rating* as the lowest floor through which the shaft passes, but not less than the rating required for the shaft enclosure.
2. They shall terminate in a room having a use related to the purpose of the shaft. The room shall be separated from the remainder of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* and opening protective shall be at least equal to the protection required for the shaft enclosure.
3. They shall be protected by *approved fire dampers* installed in accordance with their listing at the lowest floor level within the shaft enclosure.

   Exceptions:

   1. The fire-resistance-rated room separation is not required, provided there are no openings in or penetrations of the shaft enclosure to the interior of the building except at the bottom. The bottom of the shaft shall be closed off around the penetrating items with materials permitted by Section 718.3.1 for draftstopping, or the room shall be provided with an *approved automatic sprinkler system*.
   2. A shaft enclosure containing a ~~refuse chute or laundry~~ <u>waste or linen</u> chute shall not be used for any other purpose and shall ~~terminate~~ <u>discharge</u> in a room protected in accordance with Section 713.13.4.
   3. The fire-resistance-rated room separation and the protection at the bottom of the shaft are not required provided there are no combustibles in the shaft and there are no openings or other penetrations through the shaft enclosure to the interior of the building.

Reason: Editorial changes intended to use consistent terms throughout the ICC that correlate with NFPA 82.

Cost Impact: The code change proposal will not increase the cost of construction.

FS55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.11-FS-GILYEAT

FS56 – 12
713.13

Proponent: Robert Marshall, Contra Costa Fire Department, representing CalChiefs (rmars@cccfpd.org); Adria Paesani, Fountain Valley Fire Department, representing CalChiefs

Revise as follows:

713.13 Refuse and laundry chutes. Refuse, Recycling, and Laundry Chutes shall meet the requirements of <u>NFPA 82 and</u> 713.13.1 through 713.13.6.

Exceptions:

1. Chutes serving and contained within a single dwelling unit.
2. ~~Refuse and laundry chutes in Group I-2 shall comply with the provisions of NFPA 82, Chapter 5.~~

Reason: During the last code cycle, a code change was submitted and approved to add the use of NFPA 82 for trash and linen chutes in I-2 occupancies. There was a conflict between the IBC and other non-ICC regulations that created conflicts causing problems during the accreditation process. During the committee hearings, some committee members stated that it would be better to make the requirement to use NFPA 82 across the board to avoid confusion. This code change proposal does exactly that.

NFPA 82 is more robust than the current requirements found in the IBC, though several items in the IBC are more restrictive than NFPA 82, so those items remain.

Referenced Standards: NFPA 82, 2009 edition

Cost Impact: This will increase the cost of construction

FS56-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.13-FS-MARSHALL-PAESANI

FS57 – 12
713.13.1

Proponent: Sharon S. Gilyeat, Koffel Associates, Inc., representing CHUTES International

Revise as follows:

713.13.1 Refuse, recycling and laundry chute enclosures. A shaft enclosure containing a refuse, recycling, or laundry chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. Openings into the shaft, including those from access rooms and termination rooms, shall be protected in accordance with this section and Section 716. Openings into chutes shall not be located in *corridors*. Doors into chutes shall be self-closing. Discharge doors shall be self- or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.5.9.3, except that heat-activated closing device.~~s shall be permitted between the shaft and the termination room~~.

Reason: The industry standard is for the loading doors to remain normally closed and in the case of linen, access may also be secured. Allowing a loading door to a chute to be held open creates a safety risk. The risk of someone falling into the chute inadvertently is minimized by the door being normally closed. This section specifically refers to the doors to the chute from the access or discharge room. It does not refer to doors to the rooms associated with a chute. The proposed change only affects chute loading doors. It still requires all chute doors to be self-closing. The changes did not affect discharge doors which would be allowed to be held-open and obviously do not create the same safety risk. It should be noted that even the proponent of FS 39 acknowledged in their proposal that chute loading doors should not be held open even if they are automatic closing.

Cost Impact: The code change proposed will not increase the cost of construction.

FS57-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.13.1-FS-GILYEAT

FS58 – 12
713.13.2

Proponent: John D. Nicholas, Perceptive Solutions LLC, representing Unifrax I LLC (john@perceptivesolutionsllc.com)

THIS IS A 5 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC FIRE SAFETY

Revise as follows:

713.13.2 Materials. A shaft enclosure containing a refuse, recycling, or laundry chute shall be constructed of materials as permitted by the building type of construction or use a tested and listed fire resistive metallic duct system in compliance with ASTM E2816-11, which has a fire-resistance rating required by the building type of construction.

Add new standard to Chapter 35 as follows:

ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

PART II – IBC FIRE SAFETY

Revise as follows:

909.10.3 Fire-resistive Metallic Duct System. Ducts used in compliance with Section 909.10.2 that penetrate fire-resistance rated wall assemblies or *horizontal assemblies* shall be tested and listed in accordance with ASTM E2816-11.

Exception: Where the installation of a *smoke or fire damper* will not interfere with the operation of a required smoke control system in accordance with Section 909, penetrations by ducts and air transfer openings are permitted to comply with Section 717.

Add new standard to Chapter 35 as follows:

ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

PART III – IBC FIRE SAFETY

Add new text as follows:

909.20.5.1 Stair Pressurization Ducts. Ducts used to supply the air for pressurization of interior *exit stairways* shall be protected using systems tested and listed in accordance with ASTM E2816-11 or comply with Section 713.

Add new standard to Chapter 35 as follows:

ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

PART IV – IBC FIRE SAFETY

Revise as follows:

909.20.6.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both; or use a tested and listed fire resistive metallic duct system in compliance with ASTM E2816-11 as the ductwork or as an enclosure for equipment, control wiring, power wiring, or for both ductwork and enclosure purposes.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both; or use a tested and listed fire resistive metallic duct system in compliance with ASTM E2816-11 as the ductwork or as an enclosure for equipment, control wiring, power wiring, or for both ductwork and enclosure purposes.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both; or use a tested and listed fire resistive metallic duct system in compliance with ASTM E2816-11 as the ductwork or as an enclosure for equipment, control wiring, power wiring, or for both ductwork and enclosure purposes.

Add new standard to Chapter 35 as follows:

ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

PART V – IBC FIRE SAFETY

Revise as follows:

909.21.3 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator shaft enclosure.

> **Exception:** Ducts tested and *listed* for not less than 2-hour fire-resistance in accordance with ASTM E2816-11.

Add new standard to Chapter 35 as follows:

ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: (All Parts) These proposed code changes allow for the use of either a pre-fabricated duct system or field applied enclosure system. *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* is a full consensus test method that was specifically designed to assess both specific end use of the ductwork and its protection materials.

ASTM E2816-11 provides tests for all four (4) possible duct system's configurations: Conditions A, B, C, and D. The application of these Conditions can be applied to specific types of duct system's use within a building. ASTM E2816 uses the ASTM E119 time-temperature curve and replicates use of exhaust by using a fan technique to create a negative pressure within the duct similar to that occurring while a cloth's drier exhaust system is in use. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts. In ASTM E2816, the systems supports are also tested as part of the fire resistance test. ASTM E2816 offers the following tests to assess performance:

This method of tests uses the ASTM E119 time-temperature curve to test the ductwork and the enclosure materials. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts.

ASTM E2816 References
1.4.1 *Condition A*—These test methods provide a means for evaluating a **horizontal** HVAC duct system, **without openings** exposed to fire, passing through a vertical fire-separating element.
1.4.2 *Condition B*—These test methods provide a means for evaluating a **vertical** HVAC duct system, **without openings** exposed to fire and outfitted with a horizontal connection, passing through a horizontal fire-separating element.
1.4.3 *Condition C*—These test methods provide a means for evaluating a **horizontal** HVAC duct system, **with unprotected openings** exposed to fire, passing through a vertical fire-separating element.
1.4.4 *Condition D*—These test methods provide a means for evaluating a **vertical** HVAC duct system with a horizontal connection, and **with unprotected openings** exposed to fire, passing through a horizontal fire-separating element.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. ASTM E2816-11 also contains provisions for testing other service attributes of the duct system. ASTM E84 is used for the system's flame spread and smoke developed indices: ASTM E136 is used for insulation's non-combustibility: ASTM C518 is used for the insulation's durability: ASTM E814 is used for the system's ability as a firestop to prevent the spread of fire from compartment to compartment: ASTM E2226 is used for the resistance to the application of a hose stream: and ASTM C411 is used for the insulation covering's and lining's ability to resist flaming, glowing, smoldering or smoking while in service, which was just approved in December 2011 and this test method will also become part of the standard upon its latest publication.

ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* cites ASTM E2816-11 to establish requirements for fire protection enclosure systems, applied to metallic HVAC ducts, which provide an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations, as well as to determine the characteristics of the system and enclosure material currently cited in the codes. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting multiple stories

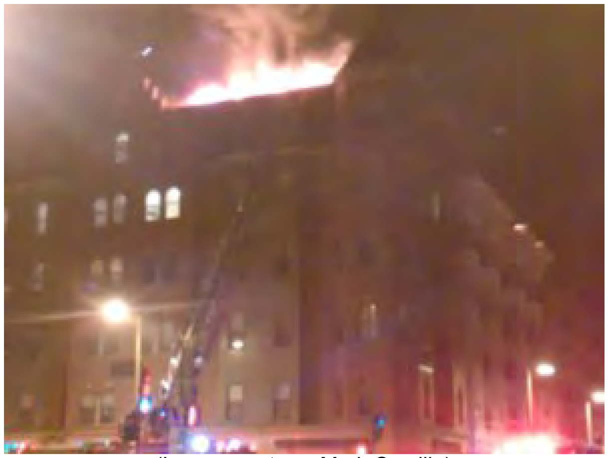
These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2816 who drafted its first version, as the proponent of the latest approved revisions to ICC ES AC179 *Acceptance Criteria For Metallic HVAC Duct Enclosure Assemblies*, as the ANSI Designated Expert to ISO TC92 Fire SC2 Fire Resistance WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 1: Ventilation Ducts* and one who has designed, supervised, and overseen HVAC fire tests as a member of an international laboratory as well as the one who had jurisdiction over the product certification process for products and materials.

(Part I) This proposed code change allows for the use of HVAC duct systems in lieu of minimum 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, when these ductwork systems are tested and listed in accordance with ASTM E2816-11.

The history of many provisions in our building codes are traced back to ASTM E119 as it is the oldest fire-resistance standard cited in the U.S. building codes. However, when fire test standards are developed for specific material applications those test standards replaced ASTM E119. There are many examples of advancements in fire testing being used to provide a fire test based on ASTM E119 but specifically developed for a particular application: doors, windows, firestop systems, joint systems, etc. For example, doors were tested to ASTM E119, then ASTM E152, and now to UL10b and 10c, which were developed to assess the door's fire performance in a specific application. As products are in service for prolonged periods of time some performance limitations are noted and addressed by industry and the codes. This proposed code change is a cost effective method of providing a test specifically designed to test the duct system as the shaft is not tested as constructed in the field but rather as a wall panel. ASTM E119 does not have a protocol for testing shafts that can be engulfed in a fire. The fire-resistance engulfment test of ASTM E2816 is a much more serve test scenario for a shaft or duct system as the volume of air within the shaft or duct is limited and will heat faster than the ambient laboratory air in contact with the wall panel. Also, the stability of the shaft as constructed in the field will react differently than a wall panel. The corners of the shaft will be tested as the sides of the shaft create stresses on the corners that are not evaluated by the ASTM E119 wall panel, which is secured into a test frame. Using tests designed to address the actual construction and application of materials is more conservative and usually increases life safety. Further, sometimes newer fire tests of materials allow more cost effective materials and construction than materials assessed by traditional tests not specifically designed to address their actual construction and application.

A recent laundry chute fire occurred September 5, 2011 in the Fenway Apartment building. "Dozens of college students were forced out of their apartments early Monday morning after fire swept through their building. The fire started in a laundry chute in the basement and burned all the way up to the roof.

The alarms started going off at around 2:30 a.m. in a six-story building at Westland Avenue and Hemenway Street in the Fenway section of the city. About 45 people, most of them students at The Boston Conservatory and the Berklee College of Music, scrambled to safety. No one was hurt. "A huge loud alarm went off and we all ran and our landlord was like, just get out as soon as you can and run. Honestly, it looked like it could have been so bad. It was just out of control," resident Jenna Schoen told WBZ NewsRadio 1030. The fire started in a laundry chute in the basement and burned all the way up to the sixth floor and the roof. There's no word yet on the cause, but it is not considered suspicious. Damage is estimated at $400,000. Residents may not be able to move back in for weeks.[1]"


(Image courtesy: Mark Corsillo)

This method of tests also assesses both an internal and external fire threat to the ductwork (refer to the table below) as well as the transition or connection of horizontal ducts to vertical ducts. Fire resistive metallic duct systems tested and listed to ASTM E2816 may provide a higher degree of fire protection. Shaft enclosures tested to ASTM E119 are tested as panels, not shafts, and are not subjected to an engulfment scenario as are fire resistive metallic duct systems tested and listed to ASTM E2816.

Bibliography:
1. http://boston.cbslocal.com/2011/09/05/dozens-of-college-students-escape-fenway-apartment-fire/

(Part II) This proposal would require HVAC ducts installed as part of a required smoke control system to be protected by a tested and listed assembly conforming to the new *ASTM E2816-11, e*valuated for the specific purpose. In addition, an exception to comply with section 717 is incorporated. This principle of protecting HVAC ducts used as part of a smoke control system from the effects of fire exposure is already contained in section 909.4 as part of a rational analysis supporting the design of smoke control systems to be employed. Section 909.4.4 requires that the design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis must include all permutations of systems status, and the design shall consider the effects of the fire on the HVAC systems.

This test is now also referenced as part of ICC-ES AC179. These standards (ASTM E2816-11 and AC179) evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by fire resistance rated construction when the HVAC duct system is exposed to fire from the outside of the horizontal or vertical HVAC duct system, or from the outside with hot gases entering the inside of the HVAC duct system from unprotected openings, when subjected to the standard time-temperature curve of ASTM E119.

(Part III) A means of egress is designed to evacuate occupants from endangered areas as quickly and efficiently as possible. It is based on such factors as number of occupants, occupant densities, and occupant characteristics (such as physical size, need for personal space, and walking speed) to meet the desired flow rates for efficient evacuation (Fire Protection Handbook 1986). A number of evacuation drills have been conducted in multi-story buildings to develop models for predicting egress times and to assess the problems encountered during evacuation (Kagawa et al. 1985; Kendik 1986; Maclennan 1985; Melinek 1975; Pauls 1975, 1977, 1980a, and 1980b). The two methods of planned evacuation are uncontrolled total evacuation, where building occupants attempt to evacuate at the same time, and controlled selective evacuation, where the building occupants evacuate under instruction from a public address system. The results of an evacuation drill using each method are compared by Pauls (1980a).[1]

The evacuating occupants require a habitable environment in order to facilitate their egress. If the ducts used to supply the air for pressurization of interior *exit stairways* are exposed to fire, the pressurized air may become super-heated creating an intolerable environment that impedes or prohibits the evacuating occupants egress.

ASTM E2816 uses the ASTM E119 time-temperature curve and by using a fan technique to create pressure within the duct similar to that occurring while a pressurization system is in use. Further, the intent of a pressurization system is two-fold: to provide a positive pressure atmosphere and a tenable environment for egress of occupants as referenced above. Allowing the pressurized air to become super-heated may create a life safety issue detrimental to the occupants during egress. Further, an unprotected duct system is susceptible to the effects of fire that may nullify or disrupt its intended use. Using tested and listed fire resistive metallic duct systems or shaft enclosures provides a pressurized air supply that is not supplying super-heated air.

ASTM E2816 is in concert with the requirements outlined in Section 909.4 and its subsections concerned with the requirement for a rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized.

Bibliography:
1. Tamura, G.T., *Stair Pressurization Systems for Smoke Control: Design Considerations*, ASHRAE Transactions, 1989, Vol. 95, Pt. 2, 9p.

(Part IV) ASTM E2816 is in concert with the requirements outlined in Section 909.4 and its subsections. This method of tests also assesses both an internal and external fire threat to the ductwork (refer to the table below) as well as the transition or connection of horizontal ducts to vertical ducts, which supplements the requirements cited in Section 909.10.2. Fire resistive metallic duct systems tested and listed to ASTM E2816 may provide a higher degree of fire protection. Construction tested to ASTM E119 are tested as panels and are not subjected to an engulfment scenario as are fire resistive metallic duct systems tested and listed to ASTM E2816.

(Part V) A means of egress is designed to evacuate occupants from endangered areas as quickly and efficiently as possible. It is based on such factors as number of occupants, occupant densities, and occupant characteristics (such as physical size, need for personal space, and walking speed) to meet the desired flow rates for efficient evacuation (Fire Protection Handbook 1986). A number of evacuation drills have been conducted in multi-story buildings to develop models for predicting egress times and to assess the problems encountered during evacuation (Kagawa et al. 1985; Kendik 1986; Maclennan 1985; Melinek 1975; Pauls 1975, 1977, 1980a, and 1980b). The two methods of planned evacuation are uncontrolled total evacuation, where building occupants attempt to evacuate at the same time, and controlled selective evacuation, where the building occupants evacuate under instruction from a public address system. The results of an evacuation drill using each method are compared by Pauls (1980a).[1]

The evacuating occupants require a habitable environment in order to facilitate their egress. If the ducts used to supply the air for pressurization are exposed to fire, the pressurized air may become heated creating an intolerable environment that impedes or prohibits the evacuating occupants egress.

Refer to Part III for additional rationale also relevant to Part V.

Bibliography:

1. Tamura, G.T., *Stair Pressurization Systems for Smoke Control: Design Considerations*, ASHRAE Transactions, 1989, Vol. 95, Pt. 2, 9p.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: FS58, Part I and FS 59 propose provisions for fire resistive metallic duct systems. The committee needs to make its intent clear with respect to these provisions. FS58, Part II and FS 135 contain similar requirements for ducts that form smoke control systems. The committee needs to make its intent clear with respect to these provisions. FS58, Part III and FS 136 contain similar requirements for stair pressurization ducts. The committee needs to make its intent clear with respect to these provisions. FS58, Part IV, FS 137 and FS139 contain similar requirements for smokeproof enclosure ventilation systems. The committee needs to make its intent clear with respect to these provisions. FS58, Part V and FS 142 contain similar requirements for elevator hoistway pressurization. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS58-12
PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART V – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.13.2-FS-NICHOLAS-909.10.3 (NEW)-FS-NICHOLAS-909.20.5.1 (NEW)-FS-NICHOLAS-909.20.6.1 (NEW)-FS-NICHOLAS-909.21.3-FS-NICHOLAS (2)

FS59 – 12
713.13.2, Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

713.13.2 Materials. A shaft enclosure containing a refuse, recycling, or laundry chute shall be constructed of materials as permitted by the building type of construction.

> **Exception:** A vertical fire-resistance rated enclosure system that complies with the requirements of Condition B of ASTM E2816-11 is permitted to enclose a refuse, recycling, or laundry chute in lieu of a shaft enclosure complying with section 713.

Add new standard to Chapter 35 as follows:

ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal permits an additional alternative to the requirement of section 713 for shaft enclosures around refuse, recycling, or laundry chutes where the chutes are contained within a tested and listed assembly conforming to Condition B of the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose.

The test method evaluate the ability of an enclosure system to resist the spread of fire from one compartment to other compartments separated by a fire resistance rated construction when the HVAC duct system is exposed to fire under one or more of the following conditions:

Condition A— Fire exposure from the outside of the horizontal HVAC duct system without openings,
Condition B— Fire exposure from the outside of the vertical HVAC duct system without openings,
Condition C— Fire exposure from the outside with hot gases entering the inside of the horizontal HVAC duct system with unprotected openings, and
Condition D— Fire exposure from the outside with hot gases entering the inside of the vertical HVAC duct system with unprotected openings.

The new ASTM Standard evaluates the materials for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of an enclosure system to resist the spread of fire from one compartment to another compartment when subjected to the standard time-temperature curve of ASTM E119.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis FS58, Part I and FS 59 propose provisions for fire resistive metallic duct systems. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS59-12

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.3.2-FS-CRIMI

FS60 – 12
713.13, 713.13.1, 713.13.2, 713.13.3, 713.13.4

Proponent: Sharon S. Gilyeat, Koffel Associates, Inc., representing CHUTES International

Revise as follows:

713.13 ~~Refuse~~ Waste and ~~laundry~~ linen chutes and incinerator rooms. ~~In other than Group I-2, refuse and laundry chutes, access and termination rooms and incinerator rooms~~ Waste and linen chutes shall comply with the provisions of NFPA 82, Chapter 5 and shall meet the requirements of Sections 713.13.1 through 713.13.6. Incinerator rooms shall meet the provisions of 713.13.4 through 713.13.5.

Exceptions:

1. Chutes serving and contained within a single dwelling unit.
2. ~~Refuse and laundry chutes in Group I-2 shall comply with the provisions of NFPA 82, Chapter 5.~~

713.13.1 ~~Refuse, recycling and laundry~~ Waste and linen chute enclosures. A shaft enclosure containing a ~~refuse, recycling, or laundry~~ waste or linen chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. Openings into the shaft~~, including those~~ from access rooms ~~and termination rooms,~~ shall be protected in accordance with this section and Section 716. Openings into chutes shall not be located in corridors. Doors shall be self-or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.5.9.3, except that heat-activated closing devices shall be permitted between the shaft and the termination room.

713.13.2 Materials. A shaft enclosure containing a refuse, recycling, or laundry chute shall be constructed of materials as permitted by the building type of construction.

713.13.3 ~~Refuse, recycling and laundry~~ Chute access rooms. Access openings for ~~refuse, recycling and laundry~~ waste or linen chutes shall be located in rooms or compartments enclosed by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Openings into the access rooms shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.5.9.3.

713.13.4 Chute ~~termination~~ discharge room. ~~Refuse, recycling and laundry~~ Waste or linen chutes shall discharge into an enclosed room separated ~~from the remainder of the building~~ by fire barriers with a fire resistance rating at least equal to the required fire-rating of the shaft enclosure and constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Openings into the ~~termination~~ discharge room from the remainder of the building shall be protected by opening protectives having a fire protection rating equal to the protection required for the shaft enclosure. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.5.9.3. ~~Refuse~~ Waste chutes shall not terminate in an incinerator room. ~~Refuse, recycling and laundry~~ Waste and linen rooms that are not provided with chutes need only comply with Table 509.

Reason: The proposed editorial code changes incorporated above are intended to bring the language of ICC more in line with industry standards by using the terms waste and linen, vs. rubbish, recycle, trash etc. These proposed terms are more generic, consistent and eliminate the need to distinguish between types of waste. Note that global changes have been submitted to the document to correct the terms in all locations and provide consistency. These terms are used inconsistently throughout the document. Note that during the last code cycle FS 191 was developed to clarify that recycling chutes are included in the requirements for chutes in IBC. This changed was accepted by the committee and incorporated into the 2012 edition of the IBC. With the changes proposed herein, the IBC will rely mostly on NFPA 82 to regulate chute requirements and therefore the definition of a waste chute is better defined in that document. This change is not intended to relax the requirements; a recycling chute would still need to protected like any other waste chute.

The technical changes are intended to have ICC incorporate NFPA 82 requirements for chutes for all occupancies not just for health care occupancies. NFPA 82, Chapter 5, was accepted as a reference standard chutes in health care occupancies during the last code cycle. The proposed technical changes also clarify that the fire resistance rating for the discharge room must have at least the same fire-rating as the shaft it serves.

It should be noted that during the committee's action on FS39 during the last cycle, many of the NFPA 82 requirements recommended by the proposer were not approved. The committee's reasoning indicated that they were not approved because the requirements were covered under NFPA 82 which was previously adopted by the committee. It is critical to understand that because the committee only adopted NFPA 82 for health care occupancies, there is still a void in the IBC. The requirements in NFPA 82 should apply to all commercial chutes. The changes proposed herein will fill that void.

Referencing NFPA 82 for all chutes will include required key construction and fire and life safety features that are currently not addressed by the IBC. Without this global adoption of NFPA 82 the following key requirements for chutes will not be covered in the IBC. These requirements have been extracted directly from NFPA 82 for easy reference and consideration by the committee.

1. Chute venting requirements:

5.2.2.4 Chute Venting.

5.2.2.4.1 A waste or linen chute shall extend (full size) at least 0.92m(3 ft) above the roof of a building of Type II-000, Type III, Type IV, or Type V construction.

5.2.2.4.2 The chute shall be permitted to extend less than 0.92m(3 ft) above the roof of a building of Type I, Type II-222, or Type II-111 construction subject to the approval of the authority having jurisdiction.

5.2.2.4.3 The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute.

5.2.2.4.4 The portion of chute between the highest intake door and the top of the chute vent shall be permitted to be offset a maximum of 45 degrees from the plumb, subject to the approval of the authority having jurisdiction.

2. Chute access and security

5.2* Gravity Waste or Linen Chutes.

5.2.1 General. General access gravity chutes shall be permitted to be supplied with unlocked doors and shall be permitted to be available to all occupants at all times.

5.2.1.1 Linen gravity chutes shall only be limited access chutes.

5.2.1.2 A limited access chute shall be secured either by locking the intake door or the entry door into the service room so that it can be used only by authorized personnel.

5.2.1.3 A gravity waste or linen chute also shall be permitted to be used to interface with a pneumatic transport system.

3. Minimum chute dimensions and offsets

5.2.2.2 Chute Offsets. See Figure 5.2.2.2.

5.2.2.2.1 Gravity metal chutes shall be constructed straight and plumb where allowed by the building configuration.

5.2.2.2.2 Gravity metal chutes shall be permitted to be offset a maximum of 15 degrees from plumb with the approval of the authority having jurisdiction.

5.2.2.2.3 Offsets shall be limited to a maximum of one offset for every two floors.

5.2.2.2.4 A single offset shall be completed (returned to vertical) between floors.

5.2.2.2.5 No access door shall be less than 1.2 m (4 ft) above an offset.

5.2.2.2.6 The portion of chute between the highest intake door and the chute termination shall be permitted to be offset a maximum of 45 degrees from the plumb, subject to the approval of the authority having jurisdiction.

5.2.2.2.7 For the purpose of this standard, a single chute offset from vertical shall include a return of the chute to vertical.

5.2.2.3 Standard Dimensions of Waste and Linen Gravity Chutes. Standard gravity chutes shall be a minimum of 571 mm (22 1⁄2 in.) by 571 mm (22 1⁄2 in.) or 610 mm (24 in.) in diameter.

4. Limitations on openings based on general vs secure access to the chute intake door

5.2.3.3 Chute Intake Doors.

5.2.3.3.1 General Access Gravity Waste Chutes.

5.2.3.3.1.1 All chute intake doors into a waste chute shall be provided with a self-closing, positive latching frame and gasketed fire door assembly having a fire protection rating of not less than 1 hour.

5.2.3.3.1.2 The door frame shall be fastened into the chute and the shaft wall.

5.2.3.3.1.3 The design and installation shall be such that no part of the frame or door projects into the chute.

5.2.3.3.1.4 The area of each chute intake door shall be limited to one-third of the cross-sectional area of a square chute and 44 percent of the area of a round chute.

5.2.3.3.2 Limited-Access Gravity Chutes.

5.2.3.3.2.1 All chute intake doors into a linen or waste chute shall be provided with a self-closing, positive-latching frame and gasketed fire door assembly having a fire protection rating of not less than 1 hour.

5.2.3.3.2.2 The door frame shall be fastened into the chute and the shaft wall.

5.2.3.3.2.3 The design and installation shall be such that no part of the frame or door projects into the chute.

5.2.3.3.2.4 A key shall be required to open the door.

5.2.3.3.2.5 The area of each waste chute intake door shall be limited to two-thirds of the cross-sectional area of the chute.

5.2.3.3.2.6 The area of each linen chute intake door shall not exceed the cross-sectional area of the chute.

There are other requirements that are critical for fire and life safety but these are the most significant ones that will be adopted if this change is incorporated. This change is critical to ensure fire and life safety in all commercial chutes in buildings. The industry is currently designing and installing chutes in accordance with this industry standard.

Cost Impact: The code change proposed will not increase the cost of construction.

FS60-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.13-FS-GILYEAT

FS61 – 12
713.14.1, 3007 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

713.14 Elevator, dumbwaiter and other hoistways. Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 713 and Chapter 30.

Revise as follows:

SECTION 3007
ELEVATOR LOBBIES

3007.1 General. Enclosed elevator lobbies shall be provided in accordance with the following sections.

1. Section 3007.2 based upon number of stories connected by a shaft enclosure.
2. Section 405.4.3 for underground buildings.
3. Sections 407.5.3 and 711.9 for Group I-2 occupancies.
4. Section 1007.4 for areas of refuge.
5. Section 3008.7.2 for fire service access elevators.
6. Section 3009.7.2 for occupant evacuation elevators.

3007.2 ~~**713.14.1**~~ **Enclosed elevator lobby.** An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   - 4.1. Group I-2 occupancies;
   - 4.2. Group I-3 occupancies; and
   - 4.3. Elevators serving floor levels over 75 feet above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1.

6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

(Renumber subsequent sections)

Reason: This proposal is one of several proposals submitted by the CTC Elevator lobby SG. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies, with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

The focus is relocation of the enclosed elevator lobby requirements in Section 713.14.1 to Chapter 30 of the IBC. This proposal is editorial in nature but is done with the hope of keeping the lobby requirements easier to apply and more consistent in the future. Section 405.4.3 contains the requirements for elevator lobbies in underground buildings. Sections 407.5.3 and 711.9 contain the requirements for elevator lobbies for the protection of horizontal assemblies in Group I-2 occupancies. The text in Section 713.14.1.1 has been relocated to new Section 3007.1 and editorially revised for consistency. Sections 3007.7.2 and 3008.7.2 (renumbered to 3008.7.2 and 3009.7.2 in this proposal) currently house the requirements for fire service access elevators and occupant evacuation elevators which have lobby construction requirements associated with them. New Section 3007.1 in this proposal now simply references users to the appropriate sections within the code for enclosed elevator lobby requirements. This way code users will be clear that there are several types of lobbies and that more than one set of requirements and triggers may apply to them. This also assists with correlation with ASME A17.1. (responsibility of committees needs to be addressed. Suggest that FS still address this new section 3007).

If this proposal should pass and FS##-12 *(TG2 Prop1)* should pass renumbering will be necessary to relocate the revised provisions from FS##-12(*TG2 Prop1)* to chapter 30. See discussion on CTC elevator lobby proposal coordination in code change FS##-12

Cost Impact: This code change proposal will not increase the cost of construction.

FS61-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #3-FS-Baldassarra-CTC

FS62 – 12
713.14.1

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby shall separate the elevator shaft enclosure doors from each floor by *fire partitions.* In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls. ~~and~~Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal. ~~p~~Penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions: *(No changes to current text)*

Reason: The intent of this proposal is to clarify that the air leakage rate for smoke and draft control doors protecting openings in elevator lobby enclosure walls shall be determined without an artificial bottom seal. This proposal would bring consistency to the three code sections covering doors in elevator lobby enclosure walls. The other two sections containing similar requirements are Section 713.14.1 Exception 3, covering the additional doors provided at the hoistway openings, and Section 3007.7.3, covering doors in the fire services access elevator lobby.

Cost Impact: None

FS62-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1-FS-EUGENE

FS63 – 12
713.14.1

Proponent: Rick Kabele, CBO, CFM, CFPS; Building Safety Associates, LLC, representing self (rick@buildingsafetyassociates.com)

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1 Group B buildings providing *medical care* on other than the level of exit discharge.
   4.~~1~~ 2 Group I-2 occupancies;
   4.~~2~~ 3 Group I-3 occupancies;
   4.4 Group R-1 occupancies;
   4.5 Group R-2 occupancies; and
   4.~~3~~6. Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

Reason: Occupants of Group B *medical care* office buildings commonly have physical impairments that render them more susceptible to the injurious effects of smoke and products of combustion. This population often requires an accessible *means of egress* to access services in building areas and levels and typically require extended time to successfully egress from the upper floors of any building. Occupants within residential occupancy groups R-1 and R-2 are expected to be asleep at various hours of any day, and when awakened by a building fire alarm system, may encounter exit corridors filled with debilitating levels of products of combustion and smoke from an incipient fire on a floor below. These persons may likely be endangered by such products of combustion arising through the unprotected vertical openings provided for unprotected elevator hoistways.

Common sense and years of fire experience have clearly demonstrated the negative impact and deleterious effect of products of combustion to human life. Individuals with compromised cardio-vascular and pulmonary functions, and the elderly, are at higher risk to be incapacitated by inhalation of any products of combustion. With this in mind, it is important that floors and corridors of Occupancy Groups B, R-1, and R-2 be protected from direct and open communication with any unenclosed vertical opening that could provide for the vertical transport of products of combustion within these at-risk occupancies.

Cost Impact: The code change proposal will increase the cost of construction.

FS63-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #1-FS-KABELE

FS64 – 12
713.14.1

Proponent: Rick Kabele, CBO, CFM, CFPS; Building Safety Associates, LLC, representing the Alliance for Fire and Smoke Containment and Control, Inc. (rick@buildingsafetyassociates.com)

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies; ~~and~~
   4.3. Group R-1 and R-2 occupancies more than four stories above the lowest level of fire department vehicle access; and
   4.~~3~~4. Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

Reason: The addition of sub-section 4.4, providing exclusions to the exception for occupancy groups R-1 and R-2 is made with the intent to provide a similar level of occupant protection to individuals of these occupancies to those of I-2 healthcare facilities who may be asleep, compromised by recognized disability, or otherwise impaired and unable to exit a building in a timely manner. The previous sub-section 4.3 is re-numbered accordingly.

Cost Impact: The code change proposal will increase the cost of construction, but not greater than that required by the codes prior to the 2012 editions.

FS64-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #2-FS-KABELE

FS65 – 12
713.14.1

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   ~~4.1 Group I-2 occupancies~~
   4.1~~2~~ Group I-3 occupancies; and
   4.2~~3~~ Elevators serving floor levels over 75 feet above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21. 7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

Reason: Previous to the 2009 version, the IBC did not require hospitals, nursing homes and boarding homes to provide elevator lobbies if the building was provided with fire sprinklers. Elevator lobbies serve no purpose on floors of facilities that "defend in place". It is a long standing practice in healthcare to evacuate patients to the adjacent smoke compartment instead of evacuating them out of the building. Group I-2 provides smoke compartmentation for an added level of protection against the spread of smoke through the building. Floors are separated into at least two smoke compartments by rated construction and provide passive protection in addition to the active protection of a sprinkler system. These compartments in effect serve the same purpose as an elevator lobby.

The addition of elevator lobbies in these facilities could complicate the movement of patients to the adjacent smoke compartment by adding doors that bedridden patients must be transferred through. While alternatives to elevator lobbies exist, all increase construction cost for facility type who have a good fire record.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

Cost Impact: None

FS65-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1-FS-Williams-Adhoc

FS66 – 12
713.14.1 (New), 713.14.1, 713.14.1.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Add new text as follows:

713.14.1 General. Enclosed elevator lobbies shall be provided in accordance with Section 713.14.2 for hoistways exceeding 420 feet (128 000 mm) in height. The height of the hoistway shall be measured from the top of the lowest finished floor to the top of the highest finished floor of the floors served by the hoistway.

The height of elevator hoistways sharing a common atmosphere by elevator door openings at a common floor or by openings between hoistways shall be measured from the top of the lowest finished floor to the top of the highest finished floor of the floors served by the non separated hoistways.

Exceptions:

1. The height of elevator hoistways sharing a common atmosphere only at a level of exit discharge shall be permitted to be measured separately.
2. The height of elevator hoistways with openings at a common floor shall be permitted to be measured separately where the hoistways are separated by at least 2 sets of doors or a revolving door that maintains a separation of the atmosphere.

713.14.2~~1~~ Elevator lobby requirements. Where an enclosed elevator lobby is required they shall be provided at each ~~floor~~ hoistway entrance ~~where an elevator shaft enclosure connects more than three *stories*~~. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by air ducts and transfer openings hall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a hoistway ~~shaft~~ in accordance with Section 712 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. ~~Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:~~
   ~~4.1 Group I-2 occupancies;~~
   ~~4.2 Group I-3 occupancies, and~~
   ~~4.3 Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.~~

~~5~~4. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.

~~6~~5. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.

~~7~~6. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

~~**713.14.1.1 Area of refuge.** Areas of refuge shall be provided as required by Section 1007.~~

Reason: This proposal is one of several proposals submitted by the CTC Elevator lobby SG. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- ☐ Review the need for elevator lobbies,~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- ☐ Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- ☐ Review related code provisions, such as egress from and through elevator lobbies.
- ☐ Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- ☐ Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- ☐ Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- ☐ Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

This proposal is a technical shift away from what has been termed by the CTC study group "traditional elevator lobbies" as opposed to Fire Service Access Elevators and Occupant evacuation elevators. This shift is based upon background data and a technical analysis produced by the Study Group on Elevator lobbies for the CTC. An executive summary of the technical analysis is as follows:

EXECUTIVE SUMMARY

The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. The code change proposals submitted are the result of the CTC's study of the issue.

This focus of the study group began with a review of technical documents and the history of the code provisions over the years. This led to extensive discussions on the intent and need for enclosed elevator lobbies and included calculations to determine the effect of stack effect in high rise buildings. This technical review resulted in a technical analysis that determined when enclosed elevator lobbies should be required.

Enclosed elevator lobbies should not be required for:

- Low-rise and mid-rise buildings not provided with sprinkler protection
- High rise buildings where the elevator hoistway is 420 feet or less in height.

Enclosed elevator lobbies should be required for:

- Elevator hoistways exceeding 420 feet in height
- Fire Service Access Elevators regardless of building height
- Occupant evacuation elevators regardless of building height

The basis for eliminating the requirement for enclosed elevator lobby separations in low-rise and mid-rise buildings (whether or not provided with sprinkler protection) is that these buildings can be evacuated in a relatively short period of time. Hence, any hazard of the spread of smoke via the elevator hoistways in these buildings is mitigated by evacuation of the building occupants.

The basis for eliminating the requirement for enclosed elevator lobby separations in high rise buildings (where the height of the elevator hoistway is 420 feet or less) is the many fire safety features required by the building code, including automatic sprinklers, that mitigate the hazard of the spread of smoke via elevator hoistways. The cooling of the smoke by automatic sprinkler discharge also reduces its buoyancy, the principal driving force which causes migration of smoke between floors. The "stack effect", the pressure differentials between floors due to differences in indoor and outdoor temperatures, is not significant enough to cause large quantities of smoke from the floor of origin to migrate to other floors in the building.

The decision to require enclosed elevator lobbies in buildings where the elevator hoistway height exceeds 420 feet in height relates to the greater concern with stack effect in such tall shafts and the potential consequences of fires in taller buildings with larger occupant loads further from the level of exit discharge.

One of the concerns that the CTC wrestled with in developing these proposals is the reliability and effectiveness of a building's many fire safety features but most specifically automatic sprinklers. To further address these concerns the technical analysis presents a brief analysis of the various protection features available in high rise buildings and how they work together. This analysis makes it clear that sprinklers are just one of many fire safety features that are part of a holistic protection strategy in high rise buildings.

Based upon the technical analysis the requirements for enclosed elevator lobbies have been shifted to hoistway heights starting beyond 420 feet. The full recommendations are listed below:

Recommendations:

1. Unsprinklered low- and mid-rise buildings (buildings with an occupied floor less than 55 feet above the lowest level of fire department vehicle access or less than 75 feet above the lowest level of fire department access with an occupant load less than 30 on each floor)

- **No enclosed elevator lobbies required for traditional elevators.**

o *Rationale: While fire temperatures can be high, causing smoke and gas migration throughout the building, occupants traveling at the typical rate of about 150 ft/min over the maximum permitted travel distance of 200 ft can reach the safety of an egress stairway in approximately 1.3 minutes and can descend to the level of exit discharge in less than five minutes. This time frame is merely an approximation but provides an indication of the required time necessary for egress in low and mid-rise buildings.*

Additionally, code officials participating in the study group stated that lobbies have traditionally not been required in these type buildings in their jurisdictions and their experience has been good.

Sprinklers are required in any building containing Fire service access (3007) and occupant evacuation (3008) elevators so these would not be found in buildings in this category.

Elevator lobbies serving as an area of refuge in accordance with Section 1007.6 for accessible means of egress are required to be enclosed by smoke barriers

2. Sprinklered buildings with occupied floors less than or equal to 75 feet to the lowest level of fire department vehicle access:

- **No enclosed elevator lobbies required for traditional elevators**

o *Rationale: In sprinklered buildings fire temperatures are kept relatively low so hot gas expansion and buoyancy are not driving forces Traditional elevators are not to be used by occupants in fires, so any small infiltration into the hoistway is not significant. Shafts shorter than 75 feet have limited stack effect flows.*

- **Enclosed lobbies required for fire service access (3007) and occupant evacuation (3008) elevators**

o *Rationale: Fire service access and occupant egress elevators need to continue in operation during a fire. Lobbies provide a protected space to stage and to await the elevator and further provide a physical barrier to smoke that might activate a lobby smoke detector and trigger Phase I recall.*

3. Sprinklered buildings with an occupied floor more than 75 feet to the lowest level of fire department vehicle access and with elevator hoistway heights less than or equal to 420 feet.

- **No enclosed elevator lobbies required for traditional elevators.**

o *Rationale: In sprinklered buildings fire temperatures at the ceiling are kept relatively low so hot gas expansion and buoyancy are not driving forces. Traditional elevators are not to be used by occupants in fires, so any small infiltration into the hoistway is not significant. Shafts shorter than 420 feet have limited stack effect flows.*

- **Enclosed elevator lobbies required for fire service access (3007) and occupant evacuation (3008) elevators**

o *Rationale: Fire service access and occupant egress elevators need to continue in operation during a fire. Lobbies provide a protected space to stage and to await the elevator and further provide a physical barrier to smoke that might activate a lobby smoke detector and trigger Phase I recall.*

4. Sprinklered buildings with hoistway heights more than 420 feet in building height

- **Enclosed elevator lobbies or pressurization of the elevator hoistways required for traditional elevators.**

o *Rationale: While traditional elevators are not permitted to be used in fires, the elevator hoistway height may result in smoke migration due to "stack effect" and spread to remote areas. Enclosed lobbies with smoke tight construction or pressurization of the hoistways will limit infiltration. The consequences of smoke spread in tall buildings with elevator hoistway heights over 420 feet was of greater concern to the Study Group.*

- **EXCEPTION:**

1. Hoistways for traditional elevators separated into vertical sections not exceeding 420 feet in height with no communication of the hoistway environment between sections shall not require enclosed lobbies or pressurization as long as the following condition is met.

2. Where connection of elevator banks is by a transfer corridor, it shall be necessary to pass through at least 2 swinging doors or a revolving door that maintains a separation of the environments to pass from one section to another.

o *Rationale: By separating the hoistways into shorter sections and limiting communication of different shaft environments, both "stack effect" and smoke migration will be limited.*

- **Enclosed elevator lobbies required for fire service access (3007) and occupant evacuation (3008) elevators**

o *Rationale: Fire service access and occupant egress elevators need to continue in operation during a fire. Lobbies provide a protected space to stage and to await the elevator and further provide a physical barrier to smoke that might activate a lobby smoke detector and trigger Phase I recall.*

5. Elevator hoistway pressurization design

- **The design of pressurization systems for elevator hoistways shall be based on a *rational analysis* in accordance with Section 909.4 that utilizes a network model approved by the AHJ and which includes an analysis of possible interactions between building shafts pressurized by different systems, and between pressurized and unpressurized shafts that exceed 420 feet in height.**

Add guidance to commentary for 909.4 that the rational analysis should show that the pressurization design will maintain the estimated Fractional Effective Dose (FED) below 0.5 and the estimated visibility distance above 25 feet within the stairway for 1.5 times the estimated evacuation time for each of the design fires selected.

o *Rationale: Taller buildings with more complex flow paths require analysis utilizing a network model that can account for these interacting flow paths. The criteria suggested for commentary represents the standard of practice for a fire hazard analysis performed as the required rational analysis.*

It is important to note that these recommendations address fire service access elevators as well as occupant evacuation elevators but such elevators are not applicable to Section 713.14. In fact the recommendation of the analysis for those types of elevators was to keep the lobbies as they provide a multitude of functions that differ from traditional elevator lobbies. Additionally it should be noted that although enclosed elevator lobbies have been eliminated in many buildings for "traditional" elevators any building containing occupied floors more than 120 feet from the lowest level of fire department access will be required to have fire service access elevators. Such elevators are required to have a lobby with several integral features. If the elevators of choice are passenger elevators in the building an enclosed elevator lobby would be required of more substantial construction as compared to what is required in Section 713.14.1. This same logic would apply in buildings that allow the use of elevators for evacuation in accordance with Section 3008. In that case lobbies would be required for the entire building regardless of building height.

Since the buildings where elevator lobbies are required by this proposal will be sprinklered and area of refuge would not be required the reference to area of refuge as it relates to elevator lobbies is no longer necessary.

If this proposal passes the other CTC proposals related to elevator lobbies may require some level of renumbering or will no longer be necessary. As this is one of several proposals from the CTC on elevator lobbies a draft assuming all the CTC elevator lobby related proposals passing is provided to show how they would integrate together. Each proposal in intent are independent with one another. There are some situations that may need approval of the CCC but the following demonstrates the intent of the CTC should all proposals pass.

Chapter 2

(G175-12) <u>**DIRECT ACCESS.** A path of travel from a space to an immediately adjacent space through an opening in the common wall between the two spaces.</u>

Chapter 7

(FS37-12) **709.4 Continuity.** *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers used ~~for~~ to enclose elevator lobbies in accordance with Section 405.4.3, 1007.6.2, 300~~7~~8.7.2 or 300~~8~~9.7.2 shall be permitted to terminate at the elevator hoistway shaft enclosure. ~~not required to extend from outside wall to outside wall.~~ A smoke and draft control door assembly as specified in Section 716.5.3.1 shall not be required at each elevator hoistway door opening.
3. Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.

(FS88-12) **716.5.3.1 Smoke and draft control.** *Fire door* assemblies shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 $m^3/s \cdot m^2$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

Exception: Where enclosed elevator lobbies are not required by Section 3007.2 ~~713.14.1~~, elevator hoistway doors opening into a corridor are not required to meet the requirements for a smoke and draft control door assembly.

Chapter 10

(E45-12) **1007.6 Areas of refuge.** Every required area of refuge shall be accessible from the space it serves by an accessible means of egress.

1007.6.1 Travel distance. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1.

1007.6.2 Stairway or elevator access. Every required area of refuge shall have direct access to a stairway ~~within an exit enclosure~~ complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4.
~~Where an elevator lobby is used as an area of refuge , the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.~~

1007.6.~~2~~3 Separation. Each *area of refuge* shall be separated from the remainder of the story by a *smoke barrier* complying with Section 709 or a *horizontal exit* complying with Section 1025. Each *area of refuge* shall be designed to minimize the intrusion of smoke.

Exception: *Areas of refuge* located within an enclosure for *exit access stairways* or *interior exit stairways* *complying with Section 1009.3 or Section 1022*.

1007.6.~~3~~5 Two-way communication. *Areas of refuge* shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

(E110-12) **Add a new item 5 to section 1014.2:**

5. Exit access through an enclosed elevator lobby is permitted. Access to at least one of the required exits shall be provided without travel through the enclosed elevator lobbies required by Sections 3007.2 ~~713.14.1~~, 300~~7~~8 or 300~~8~~9.

Where the path of exit access travel passes through an enclosed elevator lobby the level of protection required for the enclosed elevator lobby is not required to be extended to the exit unless direct access to an exit is required by other sections of this code.

(E110-12) **1018.6 Corridor continuity.** Fire-resistance-rated *corridors* shall be continuous from the point of entry to an *exit*, and shall not be interrupted by intervening rooms. Where the path of egress travel within a fire-resistance-rated *corridor* to the *exit* includes travel along unenclosed *exit access stairways* or *ramps*, the *fire resistance-rating* shall be continuous for the length of the *stairway* or *ramp* and for the length of the connecting *corridor* on the adjacent floor leading to the *exit*.

Exceptions:

1. Foyers, lobbies or reception rooms constructed as required for *corridors* shall not be construed as intervening rooms.
2. Enclosed elevator lobbies as permitted by Section 1014.2 item 5 shall not be construed as intervening rooms.

(E144-12) **1022.10 Elevator Lobby identification signs.** At landings in interior exit stairways where two or more doors lead to the floor level, the door leading to the elevator lobby shall be identified by signage located on the door or directly adjacent to the door stating “Elevator Lobby.” Signage shall be in accordance with Section 1022.9.1 items 4, 5 and 6.

(G125-12) **1027.1 General.** *Exits* shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide a direct path of egress travel ~~access~~ to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and capacity of the required exits.

Chapter 30

(FS61-12, FS66-12, FS67-12, FS70-12, E110-12,)
SECTION 3007
ELEVATOR LOBBIES

3007.1 General. Enclosed elevator lobbies shall be provided in accordance with the following sections.

1. Section 3007.2 based upon hoistway height ~~number of stories connected by a shaft enclosure~~. (*CCC*)
2. Section 405.4.3 for underground buildings.
3. Sections 407.5.3 and 711.9 for Group I-2 occupancies.
~~4. Section 1007.4 for areas of refuge.~~ (*CCC*)
4. Section 3008.7.2 for fire service access elevators.
5. Section 3009.7.2 for occupant evacuation elevators.

3007.2 ~~713.14.1~~ General. Protection of hoistway door openings ~~Enclosed elevator lobbies~~ (CCC) shall be provided in accordance with Section 3007.3 ~~713.14.2~~ for hoistways exceeding 420 feet (128 000 mm) in height. The height of the hoistway shall be measured from the top of the lowest finished floor to the top of the highest finished floor of the floors served by the hoistway.

The height of elevator hoistways sharing a common atmosphere by elevator door openings at a common floor or by openings between hoistways shall be measured from the top of the lowest finished floor to the top of the highest finished floor of the floors served by the non separated hoistways.

Exceptions:

1. The height of elevator hoistways sharing a common atmosphere only at a level of exit discharge shall be permitted to be measured separately.
2. The height of elevator hoistways with openings at a common floor shall be permitted to be measured separately where the hoistways are separated by at least 2 sets of doors or a revolving door that maintains a separation of the atmosphere.
3. Protection of elevator hoistway door openings is not required where the elevator serves only open parking garages in accordance with Section 406.5.
4. Protection of elevator hoistway door openings is not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
5. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to protect elevator hoistway door openings~~.~~ (*this is something that needs to be stated here but not in the original TG4 proposal* 2 CCC)
6. Enclosed elevator lobbies and protection of elevator hoistway door openings are not required where the elevator hoistway opens to the exterior.

3007.3 ~~713.14.2~~1 Elevator hoistway door opening protection ~~Lobby~~ requirements. Where Section **3007.2 ~~713.14.1~~** requires protection of the elevator hoistway door opening, one of the following protection options shall be provided .~~Where an enclosed elevator lobby~~ is required they ~~shall be provided~~ at each ~~floor~~ hoistway entrance ~~where an elevator shaft enclosure connects more than three *stories*~~.

1. ~~The~~ A lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by air ducts and transfer openings hall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

   ~~**Exceptions:**~~

   ~~1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~
   ~~2. Elevators not required to be located in a hoistway shaft in accordance with Section 712 are not required to have enclosed elevator lobbies.~~

2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway shaft enclosure doors from each floor by smoke partitions in accordance with Section 710 where the building is equipped throughout with an automatic sprinkler system installed in accordance with 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the smoke partitions shall comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1.

3. ~~Enclosed elevator lobbies are not required where~~ An additional door~~s~~ shall be ~~are~~ provided at ~~the~~ each elevator hoistway door opening in accordance with Section 3002.6. Such door shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
~~4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:~~
   ~~4.1 Group I-2 occupancies;~~
   ~~4.2 Group I-3 occupancies, and~~
   ~~4.3 Elevators serving floor levels over 75 feet (22 860 mm) above the lowest level of fire department vehicle access in high-rise buildings.~~
~~5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.~~
4.6. ~~Enclosed Elevator lobbies are not required where the~~ The elevator hoistway ~~is~~ shall be pressurized in accordance with Section 909.21.
~~7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.5.~~

3007.4 ~~713.14.3~~ Means of egress. Enclosed (CCC based on definition) Elevator lobbies shall be provided with at least one means of egress complying with Chapter 10 and other provisions in this code. Egress through an elevator lobby shall be permitted in accordance with Section 1014.2 item 5

~~**713.14.1.1 Area of refuge.** Areas of refuge shall be provided as required by Section 1007.~~

(note 3007 and 3008 would need to be renumbered in entirety)

(E110-12) **300~~7~~8.7 Fire service access elevator lobby.** The fire service access elevator shall open into a fire service access elevator lobby in accordance with Sections 300~~7~~8.7.1 through 300~~7~~8.7.5. Egress is permitted through the elevator lobby in accordance with Section 1014.2 item 5.

Exception: Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to open into an elevator lobby in accordance with Section 708.14.1.

(G175-12) **300~~7~~8.7.1 Interior exit stairway access.** The fire service access elevator lobby shall have direct access from the enclosed elevator lobby to an enclosure for an interior exit stairway.

Exception: Access to an interior exit stairway shall be permitted to be through a protected path of travel that has a level of fire protection not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly in accordance Section 716.5.3.

(G177-12) **300~~7~~8.7.4 Lobby size.** Regardless of the number of fire service access elevators served by the same elevator lobby, ~~each~~ the enclosed fire service access elevator lobby shall be a minimum of 150 square feet (14 m^2) in an area with a minimum dimension of 8 feet (2440 mm).

(E110-12) **300~~8~~9.7 Occupant evacuation elevator lobby.** The occupant evacuation elevators shall open into an elevator lobby in accordance with Sections 3008.7.1 through 3008.7.7. Egress is permitted through the elevator lobby in accordance with Section 1014.2 item 5.

(G175-12) **300~~8~~9.7.1 Interior exit stairway access.** The occupant evacuation elevator lobby shall have direct access from the enclosed elevator lobby to an interior exit stairway or ramp.

Exception: Access to an interior exit stairway shall be permitted to be through a protected path of travel that has a level of fire protection not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly in accordance Section 716.5.3.

(Note if all proposals pass the following proposals are no longer necessary FS71-12 and FS69-12)

Cost Impact: This code change proposal will not increase the cost of construction.

FS66-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #1-FS-Baldassarra-CTC

FS67 – 12
713.14.1, 713.14.1.1, 713.14.3 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

713.14 Elevator, dumbwaiter and other hoistways. Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 713 and Chapter 30.

713.14.1 Elevator hoistway door opening protection required. Elevator hoistway door openings shall be protected in accordance with Section713.14.2 where an elevator hoistway connects more than three stories, is required to be enclosed within a shaft enclosure in accordance with Section 712.1.1 and where any of the following conditions apply.

1. The building is not protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2
2. The building contains a Group I-2 occupancy;
3. The building contains a Group I-3 occupancy;
4. The building is a high rise building and the elevator serves floor levels over 75 feet above the lowest level of fire department vehicle access.

   Exceptions:

   1. Protection of elevator hoistway door openings is not required where the elevator serves only open parking garages in accordance with Section 406.5.
   2. Protection of elevator hoistway door openings is not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.

~~713.14.1~~ 713.14.2 Elevator hoistway door opening protection options ~~Lobby~~. Where Section 713.14.1 requires protection of the elevator hoistway door opening, one of the following protection options shall be provided.

1. An enclosed elevator lobby shall be provided at each floor ~~where an elevator shaft enclosure connects more than three stories. The~~ ~~shall~~ to separate the elevator hoistway shaft enclosure doors from each floor by fire partitions in accordance with Section 708. In addition~~, to the requirements in Section 708 for fire partitions~~, doors protecting openings in the elevator lobby enclosure walls shall ~~also~~ comply with Section 716.5.3 as required for corridor walls. ~~and~~ Penetrations of the enclosed elevator lobby ~~enclosure~~ by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1~~. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.~~

   ~~**Exceptions:**~~

   1. ~~Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.~~
   2. ~~Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.~~

2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway shaft enclosure doors from each floor by smoke partitions in accordance with Section 710 where the building is equipped throughout with an automatic sprinkler system installed in accordance

with 903.3.1.1 or 903.3.1.2. In addition, doors protecting openings in the smoke partitions shall comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9. Penetrations of the enclosed elevator lobby by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1.

3. ~~Enclosed elevator lobbies are not required where~~ An additional door~~s~~ shall be ~~are~~ provided at ~~the~~ each elevator hoistway door opening in accordance with Section 3002.6. Such door shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. ~~Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:~~
   - ~~4.1. Group I-2 occupancies;~~
   - ~~4.2. Group I-3 occupancies; and~~
   - ~~4.3. Elevators serving floor levels over 75 feet above the lowest level of fire department vehicle access in high-rise buildings.~~
5. ~~Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

   ~~In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1.~~

4.6 ~~Enclosed Elevator lobbies are not required where the~~ The elevator hoistway ~~is~~ shall be pressurized in accordance with Section 909.21.

~~7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.~~

713.14.3 Means of egress. Elevator lobbies shall be provided with at least one means of egress complying with Chapter 10 and other provisions in this code.

~~**713.14.1.1**~~ **713.14.4 Areas of refuge.** Areas of refuge shall be provided ~~as~~ where required in Section 1007.

Reason: This proposal is one of several proposals submitted by the CTC Elevator lobby SG. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies,~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

The purpose of this code change is editorial in nature and seeks only to convert the enclosed elevator lobby section to one focused on making the current exceptions equal in stature in the code to the main requirement for a lobby. This also removes some of the confusion with having requirements within some of the exceptions. This proposal focuses on the protection of the elevator opening into the hoistway enclosure versus requiring an enclosed elevator lobby. This allows the other exceptions to become more clear and equal design options.

This proposal may require correlation with other CTC Elevator Lobby SG proposals but more in terms of renumbering. Also if FS##-12 *(TG2 Proposal 1)* passes then Item 4 of new Section 713.14.1 is no longer required. See discussion on CTC elevator lobby proposal coordination in code change FS##-12

Cost Impact: This code change proposal will not increase the cost of construction.

FS67-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #4-FS-Baldassarra-CTC

FS68 – 12
713.14.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1 Group I-1, Condition 2 occupancies;
   4.2 Group I-2 occupancies;
   4.3 ~~4.2~~ Group I-3 occupancies; and
   4.4 ~~4.3~~ Elevators serving floor levels over 75 feet above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

Reason: The CTC Care facilities committee is aware of proposals from the CTC Elevator study group and the Adhoc Healthcare committee that will affect elevator lobby requirements. Currently elevator lobbies are required in Group I-2 and I-3 where smoke compartments are part of the emergency evacuation plan. The CTC Care facilities study group has asked for smoke compartments in Group I-1, Condition 2 as part of a plan to allow for staged evacuation for persons who may require limited assistance in evacuation. If the decision of the membership is that elevator lobby protection is needed in smoke compartment, they should also be required in Group I-1, Condition 2.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: The code change proposal will increase the cost of construction.

FS68-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1-FS-BALDASSARRA-CTC

FS69 – 12
713.14.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   - 4.1. Group I-2 occupancies;
   - 4.2. Group I-3 occupancies; and
   - 4.3. Highrise buildings with Elevator~~s~~ hoistways ~~travelling~~ more than ~~serving floor levels over~~ 75 feet in height. ~~above the lowest level of fire department vehicle access in high-rise buildings~~. The height of the hoistway shall be measured from the lowest floor to the highest floor of the floors served by the hoistway.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

Reason: This proposal is part of a series of proposals from the CTC addressing elevator lobbies. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies,; with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link. http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

In particular this proposal comes from the Task Group addressing the design and construction of elevator lobbies when they are required by the code.

The wording was revised to clarify that the hazard is related to taller hoistway heights versus an elevator located higher up in the high rise building. In other words a single tenant dedicated elevator that travels only a couple stories should not require an enclosed elevator lobby.

The intent of this proposal is that if item 4.3 of the 2012 remains in the code then the change shall be made but if item 4 and item 4.3 are deleted by other proposals whether from the CTC or other proponents then the revision is no longer necessary. See discussion on CTC elevator lobby proposal coordination in code change FS##-12

Cost Impact: This code change proposal will not increase the cost of construction.

FS69-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #6-FS-BALDASSARRA-CTC

FS70 – 12
713.14.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

(No changes to Exceptions 1 through 7)

8. Enclosed elevator lobbies and protection of elevator hoistway door openings are not required where the elevator hoistway opens to the exterior.

Reason: This proposal is part of a series of proposals from the CTC Elevator Lobby Study Group. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies,~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study, 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

There should be an exception similar to open parking since there is no accumulation of smoke where elevator hoist ways open to the exterior.

This proposal should not be affected by other proposals submitted by the CTC addressing elevator lobbies except for the need to renumber. None of the proposals from the CTC are intending to delete similar exceptions and thus this will simply be added as one of those exceptions. See discussion on CTC elevator lobby proposal coordination in code change FS##-12

Cost Impact: This code change proposal will not increase the cost of construction.

FS70-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #5-FS-Baldassarra-CTC

FS71 – 12

713.14.1.1, 713.14.1.2 (New), 713.14.1.3 (New), 713.14.1.4 (New), 713.14.1.5 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

713.14.1.1 Areas of refuge. Where an area of refuge is required and an enclosed elevator lobby is provided to serve as an area~~s~~ of refuge, the enclosed elevator lobby shall comply with ~~as required in~~ Section 1007.6.

713.14.1.2 Fire Service Access Elevators. Where fire service access elevators are provided, enclosed elevator lobbies shall comply with Section 3007.

713.14.1.3 Occupant Evacuation Elevators. Where occupant evacuation elevators are provided, enclosed elevator lobbies shall comply with Section 3008.

713.14.1.4 Underground buildings. Where enclosed elevator lobbies are required for underground buildings such lobbies shall comply with Section 405.4.3.

713.14.1.5 Group I-2 occupancies. Enclosed elevator lobbies required in Group I-2 Occupancies in accordance with Sections 407.5.3 and 711.9 shall comply with Section 713.14.1.

Reason. This proposal is part of a series of proposals from the CTC dealing with Elevator Lobbies. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies**,**~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

The proposed language simply provides clarification as to where all the enclosed elevator lobby requirements are located in other portions of the code. Section 713.14.1.1 was revised to be consistent in approach to the new Sections 713.14.1.2 and 713.14.1.3. Sections 713.14.1.4 and 713.14.5 were added to be consistent with the concept of pointing to other relevant sections requiring enclosed elevator lobbies. If provisions are moved from Chapter 7 to Chapter 30 this proposal is no longer necessary.

This proposal will not be necessary if the provisions in 713.14.1 are moved to chapter 30. Oter proposals such as the one revisiing to the elevator lobby exceptions to become permissions would require renumbering. Finally if the "where required provisions are heavily revised these sections may no longer be required. See discussion on CTC elevator lobby proposal coordination in code change FS##~~-~~12

Cost Impact: This code change proposal will not increase the cost of construction.

FS71-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1.1-FS-BALDASSARRA-CTC

FS72 – 12
714.2 (New)

Proponent: Renée R Jacobs, CHFM, CHC, Saint Luke's Health System

Revise as follows:

714.2 Contractor Qualifications. In buildings containing a Group I-2 occupancy, through-penetration firestop systems shall be installed by contractors qualified by UL, FM, or an approved agency.

Exception: Where the work is of a minor nature as approved by the building official.

(Renumber subsequent sections)

Reason: Proper design, installation, inspection, and maintenance of firestopping and fire-resistant joint systems are critical to fire and life safety in healthcare facilities. The life safety elements of healthcare facilities are critical to patient life and safety given that healthcare facilities defend-in-place in lieu of evacuate in the event of a fire. Accreditation entities surveying the life safety elements of healthcare facilities primarily focus on rated barriers and the integrity of the firestopping and joint installations within the rated barriers. The vast majority of findings by the accreditation surveyors are improperly installed UL systems and unsealed penetrations within the rated barriers, accounting for significant cost for corrections following a survey. Additionally, fire marshals are increasingly more educated in correct systems for different applications as well as proper installation, enforcing stricter compliance and increased extent of ramifications for non-compliance.

The extent of survey findings and deficiencies demonstrate a lack of knowledge of the correct systems and procedures for firestop and fire-resistive joint systems installation, which can be alleviated by requiring that all work be performed by a approved/qualified contractor.

The cost for corrections can be greatly reduced if the contractor is properly trained and approved/qualified. Initial construction costs remain the same for installation by an approved/qualified contractor, as the cost of approval/qualification is not substantial enough to pass along to the customer as a cost of the work. These costs can range from $6,000 to $10,000 for the initial audit and approximately $3,000 annually for ongoing audits by Underwriters Laboratories and Factory Mutual, less than many contractors would spend on bidding a sizable project, attending a trade show, entertaining or advertising. Since any firm is eligible to obtain FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor, experience shows that the main factor, the cost, can be recovered through the benefits of improved processes and reduced errors on projects.

Given that the contractor's cost for obtaining FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor is minimal, the real factor is the on-going cost of repairs for incorrect or improperly installed systems, which remains a financial burden to most healthcare facilities. Annual outlay of capital dollars for continual corrections and repairs is commonplace for most healthcare facilities and is rarely even considered in the initial construction process.

Requiring installation of UL Firestop systems by approved/qualified firestop contractors is consistent with other code requirements mandating installation by certified contractors of other life safety systems such as medical gas systems certification of contractors and/or installers. Approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories currently exist for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing fire-resistant joint systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion verifies that the company has policies and procedures in place that are sufficient to control operations resulting in installations conforming to the listed firestop system.

Availability of approved/qualified contractors that can easily attain the certification exists in virtually every state. Whereas the proposal is for the 2015 Edition of the IBC, it is reasonable to anticipate that many more contractors will participate in the programs prior to adoption of the Code.

Cost Impact: None

FS72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

714.2 (NEW)-FS-JACOBS

FS73 – 12

714.3 (New), 715.3 (New); ADMIN: 104.11.3 (New)

Proponent: James B. Smith, P.E., City of Waukesha Building Department, representing Wisconsin Code Officials Alliance (jsmith@ci.waukesha.wi.us)

Add new text as follows:

703.4 Engineering Judgments. Where the configuration of a penetrating item, group of items or a joint is such that a listed system is determined to be non-existent and reconfiguration of the penetrations or fire resistance rated assembly is determined to be impractical or impossible, alternative methods for maintaining the integrity of the required fire–resistance rating of the assembly shall be permitted to be established using an engineering analysis based on a comparison of listed systems prepared by a manufacturer's technical representative of the systems specified or prepared by the laboratory that conducted the original test. An engineering judgment shall be approved by the building official or an approved source where the information submitted is considered satisfactory. Approved engineering judgments shall be retained by the building official for the period required for retention of public records.

(Renumber subsequent sections)

714.3 Engineering Judgments. Where the configuration of a penetrating item or group of items is such that a listed system is determined to be non-existent and reconfiguration of the penetrations or fire resistance rated assembly is determined to be impractical or impossible, engineering judgments shall be permitted in accordance with Section 703.4.

(Renumber subsequent sections)

715.3 Engineering Judgments. Where the configuration of a joint is such that a listed system is determined to be non-existent and reconfiguration of the penetrations or fire resistance rated assembly is determined to be impractical or impossible, engineering judgments shall be permitted in accordance with Section 703.4.

(Renumber subsequent sections)

Reason: Engineering judgments are being used more often than necessary on construction projects. The code language that is currently being utilized to permit the use of engineering judgments is Section 104.11. Rather than relying on Section 104.11, I feel it is better to include expanded details specific to this type of engineering judgment within a newly created Section 703.4. The intent of the proposal is to provide reasonable parameter to limit the use of engineering judgments, restrict who may prepare an engineering judgment and to allow the approval of the engineering judgment to be by the building official or approved source when the documentation is considered to be acceptable. The last sentence of Section 703.4 has been provided to require retention of the engineering judgments consistent with what is required by existing text in Paragraph 104.11.2. In addition, the language is being proposed as new Sections 714.3 and 715.3 since those are the sections that address penetrations and joints.

Although there are over 8000 classified systems in the Underwriters Laboratories Fire Resistance Directory and thousands more in Intertek, FM Approvals and other laboratories listings, there are still configurations that appear at project sites that have no qualified system listed in a directory. That is particularly true when dealing with existing buildings that were constructed using materials that are outside the current norms that have been tested against. This is when the firestop contracting industry searches for advice from the manufacturer's headquarters technical personnel to seek a determination that a combination of systems that closely resembles the situation be suggested for approval from the manufacturer. Ultimately those are then forwarded to the code official for approval. As the Program Manager for the State of Wisconsin's commercial building program and the head of their material evaluation process, I was routinely called upon to review those "determinations" being proposed for use on projects in Wisconsin. In concert with Wisconsin laws on the practice of Architecture and Engineering I routinely called for those to be endorsed by the Wisconsin registered design or supervising professional (equivalent to "REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE" – as defined in Section 202) for the project prior to my review. Knowing the widespread use of the IBC does not assure the same licensing/registration requirements will exist, I have not included that as a requirement within this proposal.

The end product of that service that is most usable by the code official is when it is performed by the manufacturer's qualified technical personnel who understand the fire performance of these products in systems or a representative of the testing laboratory, and provided they use the characteristics found in similar systems to make a determination about suitability for use of the products in the specific application. The suggestions are then submitted by firestop manufacturer's technical staff through the contractor for approval. Using the knowledge from those who test the products frequently and understand their limitations, the manufacturer's technical personnel are expected to reference the closest possible tested system(s) to determine an appropriate method that provides a system closest to the field condition.

Those having the most experience with fire testing products at companies, as well as being the most removed from the sale of a specific product seem to be the manufacturer's technical personnel at headquarters locations. This Code language is needed to provide the building official transparency in the process when presented engineering judgments from the industry…only if a listed system cannot be found in the directories from any manufacturer…even if it means switching manufacturers for a few applications.

This Code language is needed to set some minimum parameters and requirements for when these determinations are permitted to be used, how these determinations (also known as Engineering Judgments or Equivalent Fire Resistance Rated Assemblies) are created, and who should be responsible for writing these determinations of suitability for use in specific applications.

Although alternative methods typically require approval by the building official, the proposal language also permits approval by an approved source (as defined in Section 202). Despite this language, on large projects there may still be a significant number of engineering judgments required and the need for the engineering judgment may be determined with relatively short lead time (due to changes that occur on the construction site). By including the language to allow approval of the engineering judgment by an approved source, pressure on code officials to grant approvals prior to installation can be reduced.

It should be noted that a separate proposal has been submitted by others to require submission of documents regarding how penetrations and joints are to be protected which should also reduce the need for engineering judgments.

During the last revision cycle various comments were raised ranging from how desperately this type of language is needed in the field to the thought that having such language will encourage an increased use of engineering judgments. I believe that by restricting the application to instances for which a listed system does not exist and by limiting who may prepare the engineering judgment there will not be an increase in the use of engineering judgments. Although the Code will now specifically permit engineering judgments, something permitted today by the Code as an alternative method, most manufacturers will continue to test applications that are commonly used in the field since there is still a cost involved in preparing engineering judgments and the use of engineering judgments has the potential to increase the construction time due to the specific approval required for an engineering judgment.

Cost Impact: None

FS73-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

714.3 (NEW)-FS-SMITH

FS74 – 12
714.3.2

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

714.3.2 Membrane penetrations. Membrane penetrations shall comply with Section 714.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire-resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum 2-hour fireresistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0 103 m2) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m2) in any 100 square feet (9.29 m2) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
   1.1. By a horizontal distance of not less than 24 inches (610 mm) where the wall or partition is constructed with individual noncommunicating stud cavities;
   1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loosefill, rockwool or slag mineral wool insulation;
   1.3. By solid fireblocking in accordance with Section 718.2.1;
   1.4. By protecting both outlet boxes with listed putty pads; or
   1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
   2.1. By the horizontal distance specified in the listing of the electrical boxes;
   2.2. By solid fireblocking in accordance with Section 718.2.1;
   2.3. By protecting both boxes with *listed* putty pads; or
   2.4. By other *listed* materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been *listed* as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by boxes other than electrical boxes, provided such penetrating items and the *annular space* between the wall membrane and the box, are protected by an *approved membrane penetration* firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required *fire-resistance rating* of the wall penetrated and be installed in accordance with their listing.
5. The *annular space* created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.
6. <u>Membrane penetrations of maximum 2-hour fire resistance-rated walls and partitions by steel Electrical boxes that exceed 16 square inches (0.0 103 m2) in area, or steel electrical boxes of any size that exceed an aggregate area through the membrane of 100 square inches (0.0645 m2) in any 100 square feet (9.29 m2) of wall area, provided the wall or partition is constructed with individual non-communicating stud cavities, the *annular space* between the wall membrane and the box does not exceed 1/8 inch (3.1 mm), and provided:</u>
   <u>6.1. All electrical boxes within the stud cavity are protected by *listed* putty pads; or</u>

6.2. <u>All electrical boxes within the stud cavity are protected by other *listed* materials and methods.</u>

Reason: This proposal reflects a very common current practice. It intends to permit an additional allowance for steel electrical boxes exceeding 16 square inches (0.0 103 m2) in area, and exceeding an aggregate area through the membrane of 100 square inches (0.0645 m2) in any 100 square feet (9.29 m2) of wall area based on testing and listing of these devices in accordance with IBC requirements for membrane penetrations in Section 714.3.1.

Listings for protection of metallic Electrical Boxes specify the conditions under which they may be installed within fire-resistance-rated wall assemblies constructed with bearing and non-bearing wood or steel studs and wallboard membranes. The Listings for metallic outlet or switch boxes identify it is possible to install the boxes under less stringent conditions when such boxes are used in conjunction with tested firestop systems or devices. The individual Classifications indicate the specific applications and the method of installation for which the materials have been investigated.

Cost Impact: This change will reduce the cost of construction by permitting additional design options.

FS74-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

714.3.2-FS-CRIMI

FS75 – 12
714.4.1.1.2

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

714.4.1.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating.
3. Floor penetrations of maximum 4-inch (102 mm) nominal diameter penetrating directly into metal-enclosed electrical power switchgear do not require a T rating.

Reason: This proposal intends to permit an additional exception for metallic EMT or conduit penetrating a horizontal assembly that directly enters a metal-enclosed power switchgear assembly. The National Electrical Code defines Metal-Enclosed Power Switchgear as a switchgear assembly completely enclosed on all sides and top with sheet metal (except for ventilating openings and inspection windows) and containing primary power circuit switching, interrupting devices, or both, with buses and connections. The assembly may include control and auxiliary devices. Access to the interior of the enclosure is provided by doors, removable covers, or both. These devices consist of a substantial metal structure and a sheet metal enclosure. The NEC further requires that, where installed over a combustible floor, suitable protection to the floor must be provided, and requires clearances for cable conductors entering these enclosures. The unobstructed space opposite terminals or opposite raceways or cables entering a switchgear or control assembly must be adequate for the type of conductor and method of termination. Insulating these conduits or tubing creates a potential hazard, and requires derating of power cables. The condition below illustrates a typical installation:

Because these EMT goes through the floor and enters directly into these robust enclosures, it is reasonable to provide an exemption to the T-Rating requirements of the IBC in these conditions.

Cost Impact: This change will reduce the cost of construction.

FS75-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

714.4.1.1.2-FS-CRIMI

FS76 – 12
714.4.1.2

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

714.4.1.2 Membrane penetrations. Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 714.4.1.1.1 or 714.4.1.1.2. Where floor/ceiling assemblies are required to have a *fire resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

Exceptions:

(No changes to Exceptions 1 through 6)

7. The ceiling membrane of 1- and 2-hour fire resistance- rated horizontal assemblies is permitted to be interrupted with the double wood top plate of a ~~*fire-resistance-rated*~~ wall assembly <u>that is sheathed with Type X gypsum wallboard</u>, provided that all penetrating items through the double top plates are protected in accordance with Section 714.4.1.1.1 or 714.4.1.1.2 <u>and the ceiling membrane is tight to the top plates.</u> ~~The *fire-resistance rating* of the wall shall not be less than the rating of the horizontal assembly.~~

Reason: This is a common structural connection and prior to the 2012 edition the code had not prohibited where the floor structure rests on the top plate in wood frame construction. The requirement for similar rating should be left to the specific application in the code (where the code requires supporting construction to be rated the same as the construction being supported (depending on the type of floor or wall). As written, even nonbearing walls serving no fire protection purpose would have to be rated for up to 2 hours. A double top plate represents a minimum of 3 inches of solid wood at the point of interruption, representing no more hazard than the noncombustible penetrations permitted by Exceptions 1 and 2 of the section, since the annular space around such penetrations needs only protection against the passage of smoke and flame or nothing at all, since in the case of steel electrical boxes up to 1/8 inch of unprotected annular space is permitted. A ceiling running into double top plates provides superior protection in comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

FS76-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

714.4.1.2-FS-FRANCIS

FS77 – 12
715.4.2 (New)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

715.4.2 Exterior curtain wall/vertical fire barrier intersections. Voids created at the intersection of nonfire-resistance rated exterior curtain wall assemblies and a fire-resistance-rated wall shall be filled, An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

Reason: In the previous cycle, a Code change proposal was approved to 707.8 which clarified that the same requirement to protect the joint between a fire barrier and the underside of the floor also applies to the joint between a fire barrier and an exterior wall. The language in the 2012 IBC points the user to compliance with section 715. However, the IBC does not specifically address the intersection of non-fire-resistance rated exterior curtain walls to rated fire barriers. The proposed language provides clear performance requirements that can be applied and enforced in these conditions. It is similar to the language in other sections of the IBC for voids created between rated and unrated assemblies..

Cost Impact:

FS77-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.4.2 (NEW)-FS-CRIMI

FS78 – 12
715.2 (New)

Proponent: Renée R Jacobs, CHFM, CHC, Saint Luke's Health System

Revise as follows:

715.2 Contractor Qualifications. In buildings containing a Group I-2 occupancy, fire-resistant joint systems shall be installed by contractors qualified by UL, FM, or an approved agency.

Exception: Where the work is of a minor nature as approved by the building official.

(Renumber subsequent sections)

Reason: Proper design, installation, inspection, and maintenance of firestopping and fire-resistant joint systems are critical to fire and life safety in healthcare facilities. The life safety elements of healthcare facilities are critical to patient life and safety given that healthcare facilities defend-in-place in lieu of evacuate in the event of a fire. Accreditation entities surveying the life safety elements of healthcare facilities primarily focus on rated barriers and the integrity of the firestopping and joint installations within the rated barriers. The vast majority of findings by the accreditation surveyors are improperly installed UL systems and unsealed penetrations within the rated barriers, accounting for significant cost for corrections following a survey. Additionally, fire marshals are increasingly more educated in correct systems for different applications as well as proper installation, enforcing stricter compliance and increased extent of ramifications for non-compliance.

The extent of survey findings and deficiencies demonstrate a lack of knowledge of the correct systems and procedures for firestop and fire-resistive joint systems installation, which can be alleviated by requiring that all work be performed by a approved/qualified contractor.

The cost for corrections can be greatly reduced if the contractor is properly trained and approved/qualified. Initial construction costs remain the same for installation by an approved/qualified contractor, as the cost of approval/qualification is not substantial enough to pass along to the customer as a cost of the work. These costs can range from $6,000 to $10,000 for the initial audit and approximately $3,000 annually for ongoing audits by Underwriters Laboratories and Factory Mutual, less than many contractors would spend on bidding a sizable project, attending a trade show, entertaining or advertising. Since any firm is eligible to obtain FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor, experience shows that the main factor, the cost, can be recovered through the benefits of improved processes and reduced errors on projects.

Given that the contractor's cost for obtaining FM Approved Firestop Contractor and/or UL Qualified Firestop Contractor is minimal, the real factor is the on-going cost of repairs for incorrect or improperly installed systems, which remains a financial burden to most healthcare facilities. Annual outlay of capital dollars for continual corrections and repairs is commonplace for most healthcare facilities and is rarely even considered in the initial construction process.

Requiring installation of UL Firestop systems by approved/qualified firestop contractors is consistent with other code requirements mandating installation by certified contractors of other life safety systems such as medical gas systems certification of contractors and/or installers. Approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories currently exist for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing fire-resistant joint systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion verifies that the company has policies and procedures in place that are sufficient to control operations resulting in installations conforming to the listed firestop system.

Availability of approved/qualified contractors that can easily attain the certification exists in virtually every state. Whereas the proposal is for the 2015 Edition of the IBC, it is reasonable to anticipate that many more contractors will participate in the programs prior to adoption of the Code.

Cost Impact: None

FS78-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

715.2 (NEW)-FS-JACOBS

FS79 – 12
715.4

Proponent: Vickie Lovell, InterCode Incorporated representing the 3M Company (vickie@intercodeinc.com)

Revise as follows:

715.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an *approved* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E 2307 to provide an *F rating* for a time period at least equal to the *fire-resistance rating* of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

> **Exception:** Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed, and shall be capable of accommodating the dynamic movement cycles associated with wind sway, thermal expansion and contraction, and seismic movement appropriate for the building height and design. Such material shall be capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period at least equal to the *fire-resistance rating* of the floor assembly.

Reason: This proposal seeks to clarify the language the 2009 Fire Safety Committee approved when they added an exception to the requirement to test perimeter joints ASTM E 2307.

In reality, this exception as written is inadequate, and should be removed altogether because it creates two paths to compliance, two test methods that are not equivalent, and a myriad of subjective ways to determine compliance with the code section. However, if the 2012 Fire Safety Committee is inclined to keep this ambiguous exception in the code, then some additional language that resembles the intent of ASTM E 2307 is needed to keep from having two completely different acceptance and performance criteria for this intersection.

ASTM E119 is not, nor has it ever been, the appropriate single test for materials for use in such a dynamic location because it only addressed the fire resistance properties of the materials tested. In 2004, the standard ASTM E 2307 "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus" was developed after more than a decade of work to specifically test this intersection. This test more accurately replicates the conditions of this unique joint, which is unlike any other opening.

During the 2006 cycle, the Fire Safety Committee approved language that completely removed the reference to ASTM E 119, and replaced it with the appropriate reference to ASTM E 2307 (FS111-07/08). The reason they provided is as follows:

The committee agreed that the single applicable standard to the test exterior curtain wall and floor intersection is ASTM E2307. This standard, unlike ASTM E119 and UL 263, addresses the unique construction details associated with the exterior curtain wall and floor intersections.

The fire exposure conditions used in ASTM E 2307 to evaluate the perimeter joint system as follows:

- the vertical passage of flames and hot gases at the building's exterior perimeter (incorporates the ASTM E119 time-temperature curve).
- the transmission of heat, flame and hot gases through the perimeter joint system.
- the movement capacity of the perimeter joint system for anticipated building movement from wind sway, seismic activity, wind loading and thermal expansion and contraction.
- the load bearing capacity of the perimeter joint system.

The construction materials used in the exterior wall is irrelevant and should not be a consideration. The test is for the void. This proposal adds similar performance requirements from ASTM E 2307 to the exception.

Cost Impact: The code change proposal will not increase the cost of construction.

FS79-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

715.4 #2-FS-LOVELL

FS80 – 12
715.4

Proponent: Vickie Lovell, InterCode Incorporated representing the 3M Company (vickie@intercodeinc.com)

Revise as follows:

715.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an *approved* system to prevent the interior spread of fire.
Such systems shall be securely installed and tested in accordance with ASTM E 2307 to provide an *F rating* for a time period at least equal to the *fire-resistance rating* of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

> ~~**Exception:** Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period at least equal to the *fire-resistance rating* of the floor assembly.~~

Reason: This proposal seeks to restore the original language that was approved by the Fire Safety Committee for the 2009 IBC before this exception was added.

The legacy codes and the 1999-2006 International Building Code addressed the fire protection of the linear void at the intersection of the fire rated floor and the exterior curtain wall using the <u>only criteria that was available at the time</u>, the ASTM E119 time/temperature curve.

However, ASTM E119 alone is not, nor has it ever been, the appropriate test for materials to for use in such a dynamic locations because it only addressed the fire resistance properties of the materials tested. In 2004, the standard ASTM E2307 "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus" was developed after more than a decade of work. This test more accurately replicates the conditions of this unique joint, which is unlike any other opening.

A perimeter joint system is a unique type of fire-resistive joint system that provides fire resistance to prevent passage of fire from floor to floor within the building at the opening between the exterior wall assembly and the floor assembly, which is not addressed by ASTM E1966, which is used to test other types of joints.

A perimeter joint system also prescribes a unique building construction detail, the intermediate-scale, multistory test apparatus (ISMA). It is not addressed by any fire test method, including ASTM E 119. ASTM E2307 describes criteria and test methods used to determine the fire resistance of perimeter joint system when subjected to standard fire exposure conditions using the intermediate-scale, multistory test apparatus (ISMA). The use of the multi-story test apparatus and this test method are intended to simulate a possible fire exposure on a perimeter joint system. It measures the performance of the perimeter joint system and its ability to maintain a seal to prevent fire spread during the deflection and deformation of the exterior wall assembly and floor assembly during the fire test, while resisting fire exposure from an interior compartment fire as well as from the flame plume emitted from the window burner below. The end point of the fire-resistance test is the period of time elapsing before the first condition of compliance is reached as the perimeter joint system is subjected to a time-temperature fire exposure.

The fire exposure conditions used in ASTM E2307 incorporates the ASTM E119 time-temperature curve, to determine the ability of the perimeter joint system to resist the vertical passage of flames and hot gases at the building's exterior perimeter, but the test method also identifies:

- The transmission of heat through the perimeter joint system.
- The movement capacity of the perimeter joint system for anticipated building movement from wind sway, seismic activity, wind loading and thermal expansion and contraction.
- The load bearing capacity of the perimeter joint system.

During the 2006 cycle, the Fire Safety Committee approved language that completely removed the reference to ASTM E119, and replaced it with the appropriate reference to ASTM E2307 (FS111-07/08). The reason they provided is as follows:

The committee agreed that the single applicable standard to the test exterior curtain wall and floor intersection is ASTM E2307. This standard, unlike ASTM E119 and UL 263, addresses the unique construction details associated with the exterior curtain wall and floor intersections.

This exception should be removed because it creates two paths to compliance, two test methods that are not equivalent, and a myriad of subjective ways to determine compliance with the code section.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

FS80-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

715.4 #1-FS-LOVELL

FS81 – 12
715.7 (New)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Add new text as follows:

715.7 Dissimilar materials. Joints installed in or between fire-resistance-rated walls or *horizontal assemblies* consisting of two or more assemblies of dissimilar materials shall be protected by an *approved fire-resistant joint system* complying with Section 715.3.

Reason: There are several instances within the IBC that provide specific guidance on the requirements governing the interaction of dissimilar materials. Specific examples are included in Sections 714, 722 and 1403. There is a need to provide specific requirements for assemblies complying with the both Sections 703 (tested) and Section 721 (calculated) fire resistance ratings. This proposal clarifies the application of Section 715 to joints between dissimilar fire-resistance rated wall, floor or ceiling assembly materials used adjacent to one another. There are numerous systems which have been tested by nationally recognized testing organizations for these applications. Information concerning these details is described in the individual systems.

Joint systems are installed in joints, voids, gaps, or other discontinuities between or bounded by two or more fire-resistance rated elements. When these assemblies are tested and listed to ASTM E119 in order to obtain their fire resistance rating, the testing/listing includes the joints that would normally occur within the floor, wall or ceiling, which would bind together and provide continuity between independent units of the same building material, such as the compound and tape joints between gypsum boards, or the mortared joints between concrete masonry units. However, the joint that could occur when that floor, wall or ceiling intersects another assembly of a different material is not anticipated nor accounted for in the E119 test. Preventing fire spread through the joint between such dissimilar materials is in fact the principle reason for testing fire-resistance rated joint systems to ASTM E1996, UL 2079. This code change would help to clarify that it is these joints between dissimilar materials/assemblies that require a joint system tested for each desired combination of materials.

Cost Impact: This code change will not increase the cost of construction.

FS81-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

715.7-FS-CRIMI

FS82 – 12

707.5, 707.9, 717.9, 711.4.1, 707.9, 711.6, 711.9, 712.1.17, 715, 715.1, 715.4.1, 715.5, 715.6, Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions, representing International Firestop Council; Gary Hamilton, Hamilton Benchmark; William Koffel, P.E., Koffel Associates; John Valiulis, Hilti, Inc (john.valiulis@hilti.com)

Revise as follows:

707.5 Continuity. Fire barriers shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed space, such as the space above a suspended ceiling. Joints ~~and voids at intersections~~ shall comply with Sections 707.8 and 707.9

707.9 Joints. Joints at the intersection of fire barriers and the underside of a non-fire resistance rated floor or roof sheathing, slab or deck above, shall comply with 715.4

711.6 Joints. Joints made in or between horizontal assemblies shall comply with Section 715.1. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section ~~715.4~~ 715.2.

711.9 Smoke barrier. Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition of smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 714.5 and 715.1.~~6~~. Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1. Openings through horizontal assemblies shall be protected by shaft enclosures complying with Section 713. Horizontal assemblies shall not be allowed to have unprotected vertical openings.

712.1.17 Nonfire-resistance-rated joints. Joints in or between floors without a required fire-resistance rating shall be permitted in accordance with Section 715.6~~1.4.1~~.

SECTION 715
~~FIRE-RESISTANCT JOINT SYSTEMS~~ PROTECTION OF JOINTS

715.1 Joints in or between systems fire resistance rated assemblies. Joints in or between fire resistance rated assemblies shall comply with Sections 715.1.1 through 715.1.4.

~~**715.1**~~ **715.1.1 General.** Joints ~~installed~~ in or between fire-resistance rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved *fire-resistant joint system* designed to prevent ~~resist~~ the passage of ~~fire~~ flames, excessive heat, and hot gases for a time period not less than
the required *fire-resistance rating* of the wall, floor or roof in or between which it is installed. *Fire-resistant joint systems* shall be tested in accordance with Section 715.1.3.

Exception: *Fire-resistant joint systems* shall not be required for joints in all of the following locations:

1. Floors within a single *dwelling unit*.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 713.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.

5. Floors and ramps within open and enclosed parking garages or structures constructed in accordance with Sections 406.5 and 406.6, respectively.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in Accordance with ASTM E119 or UL263.

~~**715.1.1 Curtain wall assembly**. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 715.4.~~

~~**715.2**~~ **715.1.2 Installation.** A fire-resistant joint system shall be securely installed in accordance with the listing criteria in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

~~**715.3**~~ **715.1.3 Fire test criteria.** Fire-resistant joint systems shall be tested in accordance with the requirements of either ASTM E 1966 or UL 2079. Nonsymmetrical wall joint systems shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side.

Exception: For exterior walls with a horizontal fire separation distance greater than 5 feet (1524 mm), the joint system shall be required to be tested for interior fire exposure only.

~~**715.6**~~ **715.1.4 Fire-resistant joint systems in smoke barriers.** *Fire-resistant joint* systems in or between smoke barriers~~, and joints at the intersection of a horizontal smoke barrier and an exterior curtainwall,~~ shall be tested in accordance with the requirements of UL 2079 for air leakage. The L rating of the joint system shall not exceed 5 cfm per linear foot (0.00775 m3/s m) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature test.

~~**715.4**~~ **715.2** ~~**Exterior curtain wall/floor intersection.**~~**Joints between fire-resistance rated floor assemblies and curtain walls.** Joints between curtain walls and floor or floor/ceiling assemblies that are required to be fire resistance rated shall comply with Sections 715.2.1 through 715.2.3.

715.2.1 Fire resistance-rated floor or floor/ceiling assemblies. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E 2307 to provide an F rating for a time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

Exception: Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period at least equal to the fire-resistance rating of the floor assembly.

~~**715.5**~~ **715.2.2 Spandrel wall.** Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require a fire-resistance rated spandrel wall, the requirements of Section 715.2.14 shall still apply to the intersection between the spandrel wall and the floor.

715.2.3 Joints at the intersection of a horizontal smoke barrier and an exterior curtain wall. Joints at the intersection of a horizontal smoke barrier and an exterior curtain wall shall be tested in accordance with the requirements of UL 2079 for air leakage. The L rating of the joint system shall not exceed 5 cfm per linear foot (0.00775 m3/s m) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

715.3 Joints between fire resistance rated walls and non-fire resistance rated floors or roofs. Joints between fire barriers and non-fire resistance rated floors or roofs shall comply with Sections 715.3.1 and 715.3.2.

715.3.1 Fire test criteria. Joints at the intersection of fire barriers with the underside of a non-fire resistance rated floor or roof sheathing, slab or deck above shall be protected by an approved continuity head of wall joint system installed as tested in accordance with ASTM E2837 and designed to resist the passage of fire for a time period not less than the required fire resistance rating of the wall in which it is installed.

715.3.2 Installation. Continuity head of wall joint systems shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

~~707.9~~ 715.4 ~~Voids at intersections~~ Joints between fire resistance rated walls and non-fire resistance rated walls. The voids created at the intersection of a fire barrier and a non-fire-resistance-rated wall shall be filled. An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

~~715.4.1~~ 715.5 ~~Exterior curtain wall/nonfire-resistance-rated floor assembly intersections~~ Joints between non-fire resistance rated floors and curtain walls. ~~Voids created at~~ Joints between ~~the Intersection of~~ exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to retard the interior spread of fire and hot gases between stories.

~~711.4.1~~ 715.6 ~~Nonfire-resistance-rated assemblies~~ **Joints within non-fire resistance rated floors.** Joints in or between floor assemblies without a required fire-resistance rating shall comply with one of the following:

1. The joint shall be concealed within the cavity of a wall.
2. The joint shall be located above a ceiling.
3. The joint shall be sealed, treated or covered with an approved material or system to resist the free passage of flame and the products of combustion.

    Exception: Joints meeting one of the joint exceptions listed in Section 715.1.

Add new standard as follows to Chapter 35:

ASTM ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

E 2634—08	Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems	1903.3
E2837 – 11	Standard Test Method for Determining the Fire Resistance of Continuity Head-Of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies	715.3
F 547—06	Terminology of Nails for Use with Wood and Wood-based Materials	Table 2506.2

Reason: Section 715 organization is revised as follows, to group the rules for any given application together, and to draw clear distinctions between each one of them.

715.1 JOINTS IN OR BETWEEN FIRE RESISTANCE RATED ASSEMBLIES
715.2 JOINTS BETWEEN FIRE RESISTANCE RATED FLOOR ASSEMBLIES AND CURTAIN WALLS
715.3 JOINTS BETWEEN FIRE RESISTANCE RATED WALLS AND NON-FIRE RESISTANCE RATED FLOORS OR ROOFS
715.4 JOINTS BETWEEN FIRE RESISTANCE RATED WALLS AND NON-FIRE RESISTANCE RATED WALLS
715.5 JOINTS BETWEEN NON-FIRE RESISTANCE RATED FLOORS AND CURTAIN WALLS
715.6 JOINTS WITHIN NON-FIRE RESISTANCE RATED FLOORS

Almost all of the code requirements are exactly as in the 2012 IBC, except moved to the appropriate new sub-section of 715. Section 715.3 is new, to incorporate the testing to the 2011-issued ASTM standard E2837. Referencing the test standard should mostly avoid the need for AHJ's to be given engineering judgments to evaluate for that same application, as the existence of the ASTM fire test and corresponding listings from UL will allow standardized, tested and listed designs to be used. The performance requirements for the joint are listed in 715.3.2, which are identical to what IBC 2012 article 707.9 required for the performance of that same joint. Thus, the only real addition is the addition of 715.3.1, which references the ASTM test standard, thus allowing the AHJ to expect some documented proof that the proposed design does meet the performance requirements as enumerated in IBC 2012.

The charging statements in the earlier parts of Chapter 7 that have pointed to sections or articles within 715 are modified to correct the articles to which they need to reference in the proposed, reorganized section 715.

715.1.1:
The change that now proposes to reference that a fire-resistive joint system will prevent the passage of "<u>flames, excessive heat, and hot gases</u>" and not just "fire" is made in order to harmonize with the IBC definition of fire resistance. The test method tests for all three, so adding this verbiage does not add any new requirements that have not always been complied with when testing to ASTM E1966 or UL 2079.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2837-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS82-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.5-FS-CRIMI-HAMILTON-KOFFEL-VALIULIS

FS83 – 12
716.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.2 Fire-resistance-rated glazing. Fire-resistance-rated glazing tested as part of a fire-resistance-rated wall or floor/ceiling assembly in accordance with ASTM E 119 or UL 263 and labeled in accordance with Section 703.6 ~~shall be permitted in fire doors and fire window assemblies where tested and installed in accordance with their listings and~~ shall not otherwise be required to comply with this section when used as part of a wall or floor/ceiling assembly. Fire-resistance-rated glazing shall be permitted in fire door and fire window assemblies where tested and installed in accordance with their listings and when in compliance with the requirements of this section.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/CTC/Pages/default.aspx. Since its inception in April/2005, the CTC has held twenty two meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Labeling of Fire Rated Glazing". The scope of the activity is noted as:

> Identify root causes of problems selecting, specifying, installing, and inspecting fire protective and fire resistive glazing and other assembly components including the frames. Propose identification requirements and other related code changes.

The changes proposed for Section 716.2 clarify how the code currently provides fire-resistance-rated glazing. The modifications to the first sentence clarify that when fire-resistance-rated glazing tested in accordance with ATM E119 and used as part of a wall or floor/ceiling assembly, it is not subject to the provisions of Section 716.

However, the second sentence clarifies that when fire-resistance-rated glazing is used as part of a fire door or fire window assembly there are provisions in Section 716 that apply to its use. As currently worded the user could be mislead as to the application of the additional requirements for applications involving fire door and window assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

FS83-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.2-FS-BALDASSARRA-CTC

FS84 – 12
716.3.1, 716.3.2 (New), 716.5.8.3, 716.5.8.3.1 and 716.6.8

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.3 Marking fire-rated glazing assemblies. *Fire-rated glazing* assemblies shall be marked in accordance with Tables 716.3, 716.5, and 716.6.

716.3.1 Identification. For fire-rated glazing, the *label* shall bear the identification required in Table 716.3 and Table 716.5. "D" indicates that the glazing is permitted to be used in *fire door* assemblies and that the glazing meets the fire protection requirements of NFPA 252. "H" shall indicate that the glazing meets the hose stream requirements of NFPA 252. "T" shall indicate that the glazing meets the temperature requirements of Section 716.5.5.1. The placeholder "XXX" represents the fire -rating period, in minutes.

716.3.2 Identification. For fire-protection-rated glazing, the *label* shall bear the following identification required in Table 716.3 and Table 716.6: "OH – XXX." "OH" indicates that the glazing meets both the fire protection and the hose-stream requirements of NFPA257 or UL9 and is permitted to be used in fire window openings. The placeholder "XXX" represents the fire-rating period, in minutes.

~~**716.3.1**~~ **716.3.3 Fire-rated glazing that exceeds the code requirements.** *Fire-rated glazing* assemblies marked as complying with hose stream requirements (H) shall be permitted in applications that do not require compliance with hose stream requirements. *Fire-rated glazing* assemblies marked as complying with temperature rise requirements
(T) shall be permitted in applications that do not require compliance with temperature rise requirements. *Fire-rated glazing* assemblies marked with ratings (XXX) that exceed the ratings required by this code shall be permitted.

716.5.8.3 Labeling. Fire-protection-rated glazing shall bear a *label* or other identification showing the name of the manufacturer, the test standard and information required in Section 716.3.1 ~~716.5.8.3.1~~ that shall be issued by an *approved agency* and shall be permanently identified on the glazing.

~~**716.5.8.3.1 Identification.** For fire-protection-rated glazing, the *label* shall bear the following four-part identification: "D - H or NH - T or NT - XXX." "D" indicates that the glazing shall be used in *fire door* assemblies and that the glazing meets the fire protection requirements of NFPA 252. "H" shall indicate that the glazing meets the hose stream requirements of NFPA 252. "NH" shall indicate that the glazing does not meet the hose stream requirements of the test. "T" shall indicate that the glazing meets the temperature requirements of Section 716.5.5.1. "NT" shall indicate that the glazing does not meet the temperature requirements of Section 716.5.5.1. The placeholder "XXX" shall specify the fire-protection-rating period, in minutes.~~

716.6.8 Labeling requirements. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section 716.3.2 and Table 716.6 that shall be issued by an approved agency and shall be permanently identified on the glazing.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/CTC/Pages/default.aspx. Since its inception in April/2005, the CTC has held twenty two meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Labeling of Fire Rated Glazing". The scope of the activity is noted as:

Identify root causes of problems selecting, specifying, installing, and inspecting fire protective and fire resistive glazing and other assembly components including the frames. Propose identification requirements and other related code changes.

The proposed changes to Section 716.3 (the addition of Section 716.3.1 and 716.3.2) clarify the requirements for marking of fire-rated glazing assemblies. No technical changes are being introduced.

Section 716.3.1 was moved from Section 716.5.8.3.1. The language was modified to clarify that the provisions of the section apply to fire-rated glazing used in fire door assemblies. Additionally, consistent with Tables 716.3 and Table 716.5, the language was modified to reflect the fact that fire-rated glazing assemblies that do not meet the temperature or hose stream requirements of this section are not required to be labeled as “NT” and “NH” respectively.

Section 716.3.2 was added to clarify that Tables 716.3 and 716.6 are the appropriate tables to be used for fire-protection-rated glazing, and to provide details of the required label and standards for performance, consistent with such tables. This section essentially reflects the same language as contained in Section 715.5.9.1 of the 2009 IBC.

The remaining changes are made to update cross-references to reflect the new section numbers.

Cost Impact: The code change proposal will not increase the cost of construction.

FS84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.3-FS-BALDASSARRA-CTC

FS85 – 12
Table 716.5

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE [b]	FIRE RATED GLAZING MARKING DOOR VISION PANEL ~~[e]~~ [d]	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	~~Not Permitted~~ See note b	~~Not Permitted~~ D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3[a]	~~Not Permitted~~ See note b	~~Not Permitted~~ D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	$1^1/_2$	100 sq. in. ~~[c]~~	□100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	$1^1/_2$	$1^1/_2$	100 sq. in. ~~[c]~~	□100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	$1^1/_2$	Not Permitted	W-90
Horizontal exits in fire walls [e]	4	3	100 sq. in.	□100 sq.in. = D-H-180 > 100 sq.in.= D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3[a]	100 sq. in.	□100 sq.in. = D-H-180 > 100 sq.in.= D-H-W-180	Not Permitted	3	Not Permitted	W-180
Shaft, exit enclosures and exit passageway walls	2	$1^1/_2$	100 sq. in. [c, ~~d~~]	□100 sq.in. = D-H-90 > 100 sq.in.= ~~D-H-T or~~ D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE b	FIRE RATED GLAZING MARKING DOOR VISION PANEL ~~e~~ d	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit ac-cess ramps, interior exit stairways, interior exit ramps and exit passageway walls	1	1	100 sq. in. ~~c, d~~	□100 sq.in. = D-H-60 >100 sq.in.= ~~D-H-T-60 or~~ D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	$^{3}/_{4}$	Maximum size tested	D-H-~~NT~~-45	$^{3}/_{4}$		D-H-~~NT~~-45	
Fire partitions: Corridor walls	1 0.5	$^{1}/_{3}$ ~~b~~ $^{1}/_{3}$ ~~b~~	Maximum size tested Maximum size tested	D-20 D-20	$^{3}/_{4}$ ~~b~~ $^{1}/_{3}$		D-H-OH-45 D-H-OH-20	
Other fire partitions	1 0.5	$^{3}/_{4}$ $^{1}/_{3}$	Maximum size tested Maximum size tested	D-H-45 D-H-20	$^{3}/_{4}$ $^{1}/_{3}$		D-H-45 D-H-20	

(continued)

TABLE 716.5—continued
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE ~~-~~ [b]	FIRE RATED GLAZING MARKING DOOR VISION PANEL [~~e~~ d]	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Exterior walls	3	1$^{1}/_{2}$	100 sq. in.[~~c~~ b]	□100 sq.in. = D-H-90 >100 sq.in = D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	1$^{1}/_{2}$	100 sq. in.[~~c~~ b]	□100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
					Fire Protection			
	1	$^{3}/_{4}$	Maximum size tested	D-H-45	$^{3}/_{4}$		D-H-45	
Smoke barriers					**Fire protection**			
	1	$^{1}/_{3}$[~~b~~]	Maximum size tested	D-20	$^{3}/_{4}$		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Two doors, each with a fire protection rating of 1$^{1}/_{2}$ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.

~~b. For testing requirements, see Section 716.6.3.~~

b ~~c~~. Fire-resistance-rated glazing tested to ASTM E 119 in accordance with Section 716.2 shall be permitted, in the maximum size tested.

c ~~d~~. Except where the building is equipped throughout with an automatic sprinkler and the fire-rated glazing meets the criteria established in Section 716.5.5.

d ~~e~~. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

e. See Section 716.5.8.1.2.1.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/CTC/Pages/default.aspx. Since its inception in April/2005, the CTC has held twenty two meetings - all open to the public.

This proposed change is a result of the CTC’s investigation of the area of study entitled “Labeling of Fire Rated Glazing”. The scope of the activity is noted as:

Identify root causes of problems selecting, specifying, installing, and inspecting fire protective and fire resistive glazing and other assembly components including the frames. Propose identification requirements and other related code changes.

Table 716.5 was heavily modified for the 2012 edition of the International Building Code to serve as a reference summary of current code requirements, i.e., the items located in the table are specified by technical language found in the code. Based upon a review of the table as currently depicted in the 2012 IBC as compared to the current language of the IBC additional items require inclusion and some items require modification to reflect the current code as modified by other proposals during the last cycle.

There are no technical changes to current code requirements proposed, the changes are editorial.

A section was added to the table for “Horizontal Exits in Fire Walls” to provide for a summary of current glazing requirements for openings in those assemblies.

Note b, (formerly note c), has be relocated to the top of the column “Door Vision Panel Size” because the allowance for fire-resistance rated glazing in the maximum size tested applies in all cases depicted.

Specific reference is added to Note b for door vision panels in fire doors located in 3 and 4 hour fire walls because only fire-resistance rated glazing is permitted to be utilized, fire protection rated glazing is not permitted in any size. The appropriate marking requirements have been added as well in the next column, “Fire Rated Glazing Marking Door Vision Panel”.

“D-H-T” or and “D-H-T-60 or” have been stricken from 2 hr “Shaft, exit enclosures and exit passageway walls” and from 1 hr “Fire barriers having a required fire-resistance rating of 1 hour:” requirements since fire-protection rated glazing is limited to the 100 sq. in. size and only fire-resistance rated glazing can be utilized in larger proportions.

NT has been stricken in several locations as the requirement for marking glazing as “not tested” for a particular feature has been eliminated as a code consideration. Glazing is simply required to be marked for those attributes it has been tested and listed for.

Existing Note b is being deleted as no longer accurate or necessary for application of the table.

Note e is added to provide guidance on where the requirements for the horizontal exit in fire walls glazing requirements are located and to highlight that there is a dimension restriction in addition to the maximum size limitation.

Cost Impact: The code change proposal will not increase the cost of construction.

FS85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5-FS-BALDASSARRA-CTC

FS86 – 12
Table 716.5, 716.5.8.1.2.1, 716.5.8.1.2.2

Proponent: Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee and Primary Fire Rated Glazing Manufacturers (tzaremba@ralaw.com)

Revise as follows:

TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL[e]	MINIMUM SIDELIGHT! TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	Not Permitted	Not Permitted	Not Permitted	4	Not Permitted	W-240
	3	3[a]	Not Permitted	Not Permitted	Not Permitted	3	Not Permitted	W-180
	2	1½	~~100 sq. in.~~ Maximum size tested [c]	~~≤100 sq.in. =~~ D-H-90 ~~>100 sq..in.=~~ or D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1½	1½	~~100 sq. in.~~ Maximum size tested [c]	~~≤ 100 sq. in. =~~ D-H-90 ~~>100 sq. in.=~~ or D-H-W-90	Not Permitted	1½	Not Permitted	W-90
Shaft, exit enclosures and exit passageway walls	2	1½	100 sq. in.[c,d]	≤100 sq. in. = D-H-90 >-100 sq in.= D-H-T-or D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

Fire barriers having a required fire- resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways, interior exit ramps and exit passageway walls	1	1	100 sq. in.[c,d]	≤10 0 sq.in. = D-H-60 >100 sq.in.= D-H-T-60 or D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	3/4	Maximum size tested	D-H-NT-45	3/4		D-H-NT-45	
Fire partitions: Corridor walls	1 0.5	1/3[b] 1/3[b]	Maximum size tested Maximum size tested	D-20 D-20	^{3}3/4[b] 1/3		D-H-OH-45 D-H-OH-20	
Other fire partitions	1 0.5	3/4 1/3	Maximum size tested Maximum size tested	D-H-45 D-H-20	3/4 1/3		D-H-45 D-H-20	

TABLE 716.5—continued
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL[e]	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Exterior walls	3	1½	~~100 sq. in.~~ Maximum size tested[c]	~~≤100 sq.in. =~~ D-H-90 ~~> 100 sq. in. =~~ or D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	1½	~~100 sq. in.~~ Maximum size tested[c]	~~≤100 sq.in. =~~ D-H-90 ~~>100 sq.in.=~~ or D-H-W-90	Not Permitted	2	Not Permitted	W-120
					Fire Protection			
	1	3/4	Maximum Size tested	D-H-45	3/4		D-H-45	
Smoke barriers					Fire protection			
	1_1	1/3[b]	Maximum Size tested SizeTested size tt	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm

a. Two doors, each with a fire protection rating of 1½ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. For testing requirements, see Section 716.6.3.
c. Fire-resistance-rated glazing tested to ASTM E 119 in accordance with Section 716.2 shall be permitted, in the maximum size tested.
d. Except where the building is equipped throughout with an automatic sprinkler and the fire-rated glazing meets the criteria established in Section 716.5.5.
e. Under the column heading "Fire-rated glazing marking door vision panel," W refers to the fire-resistance rating of the glazing, not the frame.

716.5.8.1.2.1 Horizontal exits. Fire-protection rated glazing shall be permitted ~~as vision panels~~ in 1½-hour fire protection rated, self-closing swinging fire door assemblies serving as horizontal exits in fire walls ~~where limited to 100 square inches (0.065 m^2) with no dimension exceeding 10 inches (0.3 m^2)~~.

716.5.8.1.2.2 Fire barriers. Fire-protection-rated glazing shall be permitted in fire doors having a 1½-hour fire protection rating intended for installation in fire barriers~~, where limited to 100 square inches (0.065 m^2)~~.

Reason: This proposal eliminates an inconsistency in the IBC and an inconsistency between the IBC and NFPA 80. In that regard, IBC section 716.5 says that "fire door assemblies and shutters shall be installed in accordance with … NFPA 80." In turn, NFPA 80 provides that fire protection rated glazing may be used to the maximum sizes tested in 1½ hour fire protection rated doors in fire walls and fire barriers. In allowing fire protection rated glazing in the maximum sizes tested in these applications, NFPA 80 correctly recognizes that, since the doors in these applications are not fire-resistance or temperature rise rated, there is no reason to limit their use of fire protection rated glazing to 100 sq. in. If adopted, this proposal would reconcile these sections of the IBC and NFPA 80.

Cost Impact: The code change proposal will not increase the cost of construction.

FS86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T716.5-FS-ZAREMBA

FS87 – 12
716.5.2

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Won-Door Corporation (wkoffel@koffel.com)

Revise as follows:

716.5.2 Other types of assemblies. *Fire door* assemblies with other types of doors, including swinging elevator doors, horizontal sliding fire door assemblies, and fire shutter assemblies, bottom and side-hinged chute intake doors, and top-hinged chute discharge doors, shall be tested in accordance with NFPA 252 or UL 10B. The pressure in the furnace shall be maintained as nearly equal to the atmospheric pressure as possible. Once established, the pressure shall be maintained during the entire test period.

Reason: Paragraph 716.5.1 applies to side-hinged or pivoted swinging doors and Paragraph 716.5.2 applies to other types of fire doors. However, the list of other types of fire doors is not all inclusive which has led some to wonder how the provisions apply to fire protection rated horizontal sliding doors. Therefore, the phrase “horizontal sliding doors” has been proposed to be added to the list.

Alternatively, if concern exists that the list may still be incomplete, all the text between the first and second comma could be deleted, thereby deleting the list from the Code and indicating that Paragraph 716.5.2 applies to all doors other than those covered by Paragraph 716.5.1.

Cost Impact: None

FS87-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.2-FS-KOFFEL

FS88 – 12
716.5.3.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.5.3.1 Smoke and draft control. *Fire door* assemblies shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 $m^3/s \cdot m^2$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

> **Exception:** Where enclosed elevator lobbies are not required by Section 713.14.1, elevator hoistway doors opening into a corridor are not required to meet the requirements for a smoke and draft control door assembly.

Reason: The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

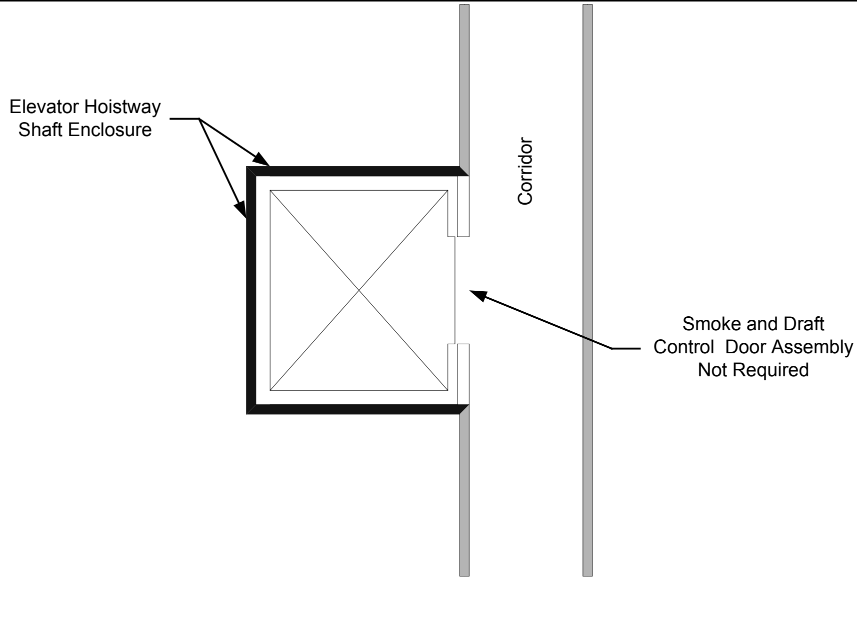
- Review the need for elevator lobbies,~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

This proposal is intended to clarify that when an enclosed elevator lobby is not required in accordance with Section 713.14.1 that smoke and draft protection is not required when the hoistway opens into a rated corridor. See figure below. Section 713.14.1 is based upon number of stories and not the fact that such elevators open onto a rated corridor so it is not entirely clear how the code is currently written that this was the intent . The following are the sections that are relevant to this issue and which demonstrate how such confusion could occur. The lobby provisions are independent from the corridor provisions.

Note that this proposal is one of several proposals submitted by the CTC Elevator Lobby study group. This particular proposal will be correlated as necessary. For instance if the elevator lobby provisions are moved to chapter 30 then the referenced section will be appropriately revised. See discussion on CTC elevator lobby proposal coordination in code change FS##-12



SECTION 716.5.3.1, EXCEPTION – SMOKE AND DRAFT CONTROL AT HOISTWAY

713.14 Elevator, dumbwaiter and other hoistways. Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 713 and Chapter 30.

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge*, provided the level(s) of *exit discharge* is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies; and
   4.3. Elevators serving floor levels over 75 feet above the lowest level of fire department vehicle access in high-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.3.

713.14.1.1 Areas of refuge. Areas of refuge shall be provided as required in Section 1007.

SECTION 1018 CORRIDORS

1018.1 Construction. *Corridors* shall be fire-resistance rated in accordance with Table 1018.1. The *corridor* walls required to be fire-resistance rated shall comply with Section 709 for *fire partitions*.

Exceptions:

1. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group E where each room that is used for instruction has at least one door opening directly to the exterior and rooms for assembly purposes have at least one-half of the required *means of egress* doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A *fire-resistance rating* is not required for *corridors* contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A *fire-resistance rating* is not required for *corridors* in *open parking garages*.
4. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group B which is a space requiring only a single *means of egress* complying with Section 1015.1.
5. Corridors adjacent to the exterior walls of buildings shall be permitted to have unprotected openings on unrated exterior wall where unrated walls are permitted by Table 602 and unprotected openings are permitted by Table 705.8.

SECTION 708 FIRE PARTITIONS

708.1 General. The following wall assemblies shall comply with this section.

1. Walls separating *dwelling units* in the same building as required by Section 420.2.
2. Walls separating *sleeping units* in the same building as required by Section 420.2.
3. Walls separating tenant spaces in *covered mall buildings* as required by Section 402.7.2.
4. Corridor walls as required by Section 1018.1.
5. Elevator lobby separation as required by Section 713.14.1.

708.2 Materials. The walls shall be of materials permitted by the building type of construction.

708.3 Fire-resistance rating. Fire partitions shall have a *fire-resistance rating* of not less than 1 hour.

Exceptions:

1. Corridor walls permitted to have a $^1/_2$ hour *fire-resistance rating* by Table 1018.1.
2. *Dwelling unit* and *sleeping unit* separations in buildings of Type IIB, IIIB and VB construction shall have *fire-resistance ratings* of not less than $^1/_2$ hour in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

708.6 Openings. Openings in a *fire partition* shall be protected in accordance with Section 716.

SECTION 710 SMOKE PARTITIONS

710.1 General. Smoke partitions installed as required elsewhere in the code shall comply with this section.

710.5 Openings. Openings in smoke partitions shall comply with Sections 710.5.1 and 710.5.2.

710.5.1 Windows. Windows in smoke partitions shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke.

710.5.2 Doors. Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.

710.5.2.1 Louvers. Doors in smoke partitions shall not include louvers.

710.5.2.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 $m^3/(s \cdot m^2)$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

SECTION 716 OPENING PROTECTIVES

716.1 General. Opening protectives required by other sections of this code shall comply with the provisions of this section.

716.5 Fire door and shutter assemblies. Approved *fire door* and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 716.5.1, 716.5.2 or 716.5.3 and the *fire protection rating* indicated in Table 716.5. *Fire door* frames with transom lights, sidelights or both shall be permitted in accordance with Section 716.5.6. *Fire door* assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for tin-clad *fire door* assemblies.
2. Floor *fire door* assemblies in accordance with Section 711.8.

TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL [e]	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING SIDELITE/ TRANSOM PANEL
Fire partitions: Corridor walls	0.5	1/3[b]	Maximum size tested	D-20	1/3	D-H- OH-20

716.5.3 Door assemblies in corridors and smoke barriers. *Fire door* assemblies required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.5 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has at least one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit* passageway.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.3 and 408.8.4 in occupancies in Group I-3.

Cost Impact: The code change proposal will not increase the cost of construction.

FS88-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.3.1-FS-BALDASSARRA-CTC

FS89 – 12

716.5.3.2, 716.5.3.2.1 (New), 716.6.7.4 (New)

Proponent: Robert J Davidson, Davidson Code Concepts, LLC, representing SaftiFirst a Division of O'Keeffes, Inc. (rjd@davidsoncodeconcepts.com)

Revise as follows:

716.5.3 Door assemblies in corridors and smoke barriers. *Fire door* assemblies required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.5 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions: *(No change to current text)*

716.5.3.2 Glazing in door assemblies. In a 20-minute *fire door assembly*, the glazing material in the door itself shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lights and sidelights, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 716.6, subject to the limitations in Section 716.5.3.2.1.

716.5.3.2.1 Glazing in sidelites. The use of fire protection rated glazing in sidelites shall be limited to a minimum of 44 inches above the finished floor surface.

716.6.7 Interior fire window assemblies. Fire-protection- rated glazing used in *fire window assemblies* located in *fire partitions* and *fire barriers* shall be limited to use in assemblies with a maximum *fire-resistance rating* of 1 hour in accordance with this section.

716.6.7.4 Interior fire windows in fire-resistant rated corridors and exit passageways. Fire protection-rated glazing in fire windows tested to NFPA 257 used in fire-resistant rated corridors and exit passageways shall be limited to applications where the bottom edge of the window frame is a minimum of 44-inches above the finished floor surface. The bottom edge height of fire resistance rated glazing tested as an assembly to ASTM E119 or UL 263 and rated a minimum of 1-hour shall not be limited.

Reason: The purpose of this proposal is to provide for protection of specific egress paths against radiant heat exposure that can occur through the use of fire protection rated glazing. Building codes in other countries such as New Zealand and the United Kingdom have taken this exposure problem into account in the application of their requirements with height above egress path limitations of 1100 mm (43.3 inches) and up to 2 M (6.6 feet).

Fire protection rated glazing materials do not protect against radiant heat. The unrestricted use of these materials in exit corridors in the large sizes for which they have been tested and listed threaten the life safety of building occupants attempting to exit past them in a fire as well as firefighters using the same protected path for rescue and firefighting. By restricting the use of these materials to above 44" from the floor along specific egress paths, occupants and firefighters can crawl below the level of the fire windows, and combustibles piled on the floor are not as likely to pose a threat to windows installed at this height.

This proposal addresses the radiant heat issue by providing for a height limitation in the application of fire protection rated glazing in sidelights with proposed Section 716.5.3.2.1 and the use of fire protection rated glazing in specific egress paths in proposed Section 716.6.7.2.

The recognition of this issue is not restricted to overseas; NFPA 80 provides background information and recommends that the consideration be given to the issue.

NFPA 80-2010

4.4.5* *Glazing material shall be permitted in fire doors having the fire protection ratings shown in Table 4.4.5 when tested in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, and shall be limited in size and area in accordance with Table 4.4.5.*

A.4.4.5 *Doors containing fire resistance–rated glazing materials fabricated and tested as door assemblies in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, to determine a fire protection rating should be regulated by this standard as a fire assembly and not as a glazing material permitted in fire door assemblies as prescribed in Section 4.4.*

Regarding Table 4.4.5, footnote c, consideration should be given to limiting fire protection glazing size in non–temperature rise doors where 60- and 90-minute fire protection is required due to radiant heat hazards. See Annex I.

If the limited amount of glazing in a fire door presents a risk, fire windows along a corridor or exit passageway would be a greater risk. Within NFPA 80 Appendix I the opening paragraph states:

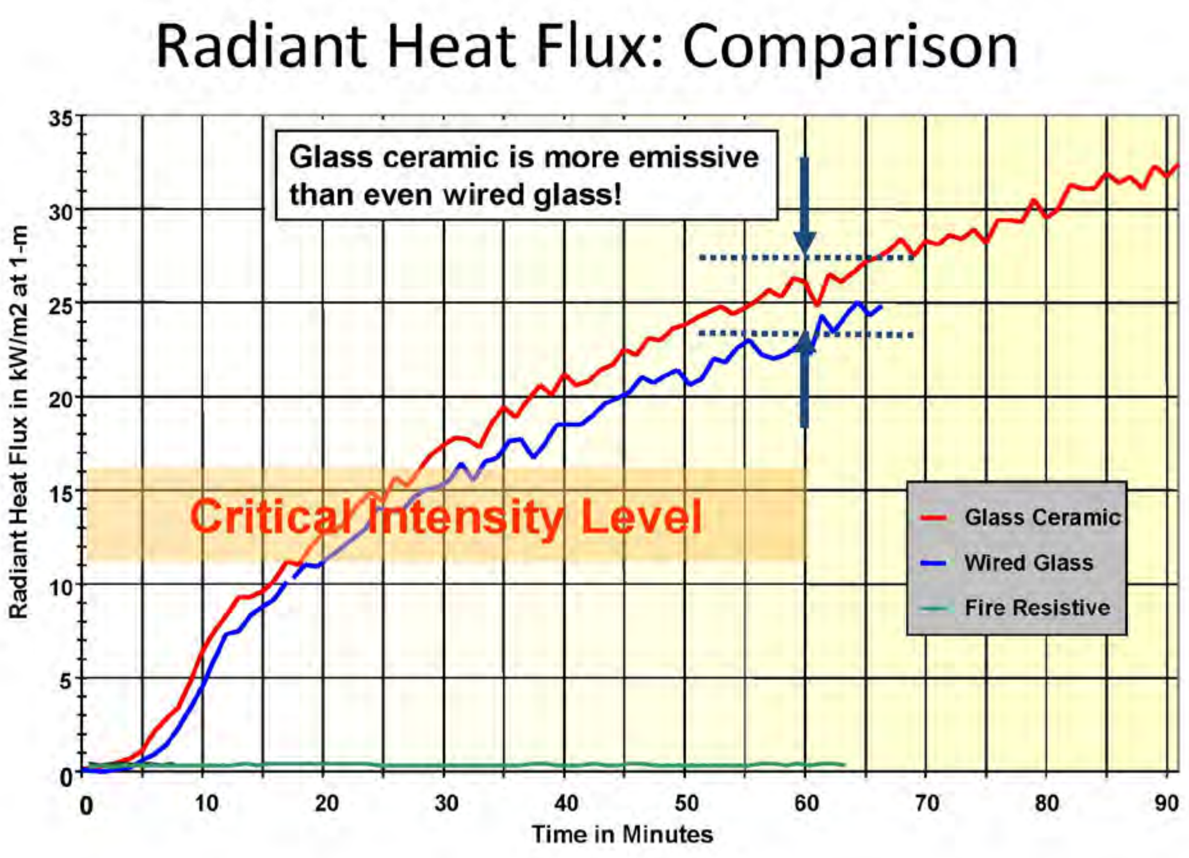
I.1 Background. *Fire windows were originally designed for protecting openings in exterior walls. In such applications, radiant heat transfer was not a significant consideration, since the main function of fire windows was to contain the flames within the building. However, where fire windows are used in interior partitions, users of this standard might need to consider radiant heat transfer during fire. Exiting through corridors and past fire windows could be compromised, and combustible materials on the unexposed side of fire windows could be ignited. The information that follows is a guide to the evaluation of radiant heat transfer through fire windows.*

The third paragraph of NFPA 80 Appendix I states:

Test Method. Because the present fire test standard, NFPA 257, does not require measuring and reporting temperature rise on the unexposed face of the glazing material or radiant heat transmission, glazing products tested to this standard have not been required to retard heat transfer. However, these data are required in many European fire test standards. [2] As a result, European building codes place limitations on the use of glazing in fire-resistant partitions inside buildings and require the use of insulating glazing in means of egress as well as where combustibles could be in close proximity

This code change at the same time permits use in larger sizes of products that meet fire resistance radiant heat and temperature rise limits of ASTM E119, as those products do not transmit dangerous levels of radiant heat.

Fire test data show that at 45-minutes, these products transmit in excess of 20 kW/m^2, at 20 minutes of fire exposure, these materials transmit in excess of 10 kW/m^2, and at 10 minutes of fire exposure, transmit 5 kW/m^2. http://vimeo.com/13218481 See below, Chart Cumulative Radiant Heat Energy Data Chart, prepared by the test sponsor of the test cited above. The Society of Fire Protection Engineers Fire Protection Engineering Handbook identifies a fairly obvious tolerance limit for exposure to radiant heat of 2.5 kW/m^2 due to unbearable pain. (See SFPE Handbook of Fire Protection Engineering, 2nd edition, page 2-114).



Also included as further support of this code change are two test reports from the Coast Guard testing of (1) Ceramic (FireLite) in steel bulkheads (Report No. CG-D-37-95), and (2) wired glass in steel bulkheads (Report No. CG-D-38-95). Temperature rise and radiant heat flux measurements were recorded. The tests were intended to measure radiant heat flux and surface temperature performance at 60 minutes.

The tests can be summarized as follows:

Wired Glass Test

The test of the wired glass panels resulted in glazing failure prior to 60-minutes, so radiant heat and temperature rise were only recorded up to the time of the wired glass failure.

Test 1

- Heat flux at end of test (41:24 minutes) - 71 kW/m sq.
- Surface temperature - wired glass temperature - 730 degrees C; steel frame - 540 degrees C

Test 2

- Heat flux at end of test (37:46 minutes) - 48 kW/m sq.
- Surface temperature - wired glass temperature - 730 degrees C; steel frame - 550 degrees C

Test 3

- Heat flux at end of test (48:30 minutes) - 57 kW/m sq.
- Surface temperature - wired glass temperature - 760 degrees C; steel frame - 585 degrees C

Conclusion on page 8 - As the window panes began to reach their melting point and flow out of the test frame, the recorded heat flux levels showed obvious increases. In all three tests, the recorded heat flux increased approximately 5-7 kW/m sq. until the wire glass fell out of the test frame and the test was terminated.

Ceramic (FireLite) Test

Test 1

- Heat flux at end of test (60:00 minutes) - 75 kW/m sq.
- Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

Test 2

- Heat flux at end of test (60:00 minutes) - 69 kW/m sq.
- Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

Test 3

- Heat flux at end of test (60:00 minutes) - 73 kW/m sq.
- Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

According to these test reports, the surface temperature is significantly higher on the glazing than it is on the steel frame. Also, the report notes that the radiant heat measurements taken that included the "cooler steel frame" were several percentages lower than the view that included just the glazing. (see Ceramic test report (Report No. CG-D-37-95), page 6.)

Limitations on area uses of fire protection-rated glazing products is long overdue. In Europe, code regulators have recognized the need for restricting use of fire protection-rated glazing materials based on radiant heat hazards, particularly their use in egress paths. Reasonable limits protecting life safety are achieved by limiting the height of windows in exit corridors, permitting building occupants safe egress. The restriction on use in other fire barriers and fire partitions reduces the possibility of fire spread due to auto-ignition, which test data show can occur well before the 45-minute fire exposure to which fire protection-rated glazing products have been tested.

Bibliography

1. Test Report, Fire Performance of Three Wired Glazed Window Assemblies, Report No. CG-D-38-95
   http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA302226
2. Test Report, Fire Performance Evaluation of Three A-O Glazed Window Assemblies, Report No. CG-D-37-95
   http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA302316
3. New Zealand Compliance Document for New Zealand Building Code Clauses C1, C2, C3, C4 Fire Safety
   http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Compliance-documents/C-fire-safety-1st-edition-amendment-9.pdf
4. United Kingdom Building regulations Fire Safety, Volume 2 – Buildings Other than Dwellinghouses
   http://www.planningportal.gov.uk/uploads/br/BR_App_Doc_B_v2.pdf
5. NFPA 80-2010 “Standard for Fire Doors and Other Opening Protectives”
   http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=80

Cost Impact: This code change will not increase construction costs, as fire protection-rated glazing materials are still permitted, and the cost of fire resistance products permitted for larger applications and next to the floor is now comparable to safety rated fire protection products that pass hose stream testing.

FS89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.6.7.3 (NEW)-FS-DAVIDSON

FS90 – 12

716.5.3.2, 716.5.4, 716.5.4.1 (New)

Proponent: Robert J Davidson, Davidson Code Concepts, LLC, representing SaftiFirst a Division of O'Keeffes, Inc. (rjd@davidsoncodeconcepts.com)

Revise as follows:

716.5.3.2 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material ~~in the door itself~~ shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test. ~~Glazing material in any other part of the door assembly, including transom lights and sidelights, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 716.6~~.

716.5.4 Door assemblies in other fire partitions. Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in other fire partitions having a fire-resistance rating of 0.5 hour in accordance with Table 716.5 shall be tested in accordance with NFPA 252, UL 10B or UL 10C ~~with~~ <u>without</u> the hose stream test.

<u>**716.5.4.1 Glazing in door assemblies.** In a 20-minute fire door assembly, the glazing material shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test.</u>

Reason: This code change proposal is intended to eliminate an unnecessary hose stream test requirement test requirement, provide for increased consistency in the code requirements and increased consistency with the referenced standards for fire door assemblies.

The first change is at Section 716.5.3.2. A 20 minute fire door in a corridor or smoke barrier does not require a hose stream test. Section 716.5.3.2 does not require a hose stream test for the glazing in the door itself, but it then requires the hose stream test for the glazing located anywhere else in the fire door assembly. This does not make sense, it is one assembly and it should be consistently tested as an assembly to the same standard. The hose stream test is either needed or it is not.

The next proposed change is to eliminate the hose stream test requirement for 20 minute doors in other fire partitions. Since we have eliminated the requirement for 20 minute doors in corridors (the means of egress protection) and smoke barriers (patient protection), why would we then require the hose test in other cases of 20 minute doors located in fire partitions that only have a 0.5 hour rating? This lacks consistency.

The final proposed change is to add glazing requirement language for the "other fire partition" door assemblies, matching the language proposed for the doors in corridors and smoke barriers.

It should be noted that NFPA 80 "Standard for Fire Doors and Other Opening Protectives" 2010 edition provides for the door and the glazing to be tested as an assembly in accordance with NFPA 252 which is consistent with Section 716.5.3 and points out the difference between glazing tested separately as fire protection rated glazing and then installed in a fire door as compared to glazing tested as part of the door assembly. (See A.4.4.5)

NFPA 80-2010

4.4.4* *Fire protection glazing not exceeding 100 in.2 (0.065m2) shall be permitted in fire doors having a 3-hour fire protection rating or in fire doors having a 1½-hour fire protection rating for use in severe exterior fire exposure locations <u>where the fire protection glazing has been tested for the desired rating period with no through-openings in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies</u>.*

4.4.5* *<u>Glazing material shall be permitted in fire doors having the fire protection ratings shown in Table 4.4.5 when tested in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies</u>, and shall be limited in size and area in accordance with Table 4.4.5.*

A.4.4.5 *<u>Doors containing fire resistance–rated glazing materials fabricated and tested as door assemblies in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, to determine a fire protection rating should be regulated by this standard as a fire assembly and not as a glazing material permitted in fire door assemblies as prescribed in Section 4.4</u>.*

The NFPA 252 "Standard Methods of Fire Tests of Door Assemblies" 2008 edition provides for the elimination of the hose stream test at the option of the sponsor, recognizing that there are codes that allow for elimination of the hose stream test and it goes on to explain that the elimination is based upon the field application.

NFPA 252-2008
6.2 Hose Stream Test.

6.2.1 Within the 2 minutes immediately following the fire test, the fire-exposed side of the fire door assembly shall be subjected to the impact, erosion, and cooling effects of a standard hose stream, unless otherwise permitted by 6.2.2.*

6.2.2* *For 20-minute fire protection–rated fire door assemblies, at the option of the test sponsor, the hose stream test shall not be required to be performed.*

A.6.2.2 *The elimination of the hose stream test for some 20-minute-rated assemblies is based on their field application.*

Since NFPA 80 identifies that the glazing be tested as part of the fire door assembly in accordance with NFPA 252, and NFPA 252 recognizes the elimination of the hose stream test with no special requirement that the glazing be subjected to the hose stream test anyway, this proposal will provide for better harmony between the IBC and the referenced standards.

Cost Impact: The code change proposal will reduce the cost of construction.

FS90-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.3.2-FS-DAVIDSON

FS91 – 12
716.5.5.1

Proponent: Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee and Primary Fire Rated Glazing Manufacturers (tzaremba@ralaw.com)

Revise as follows:

716.5.5.1 Glazing in doors. Fire-protection-rated glazing in excess of 100 square inches (0.065 m2) is not permitted. Fire-resistance-rated glazing in excess of 100 square inches (0.065 m2) shall be permitted in *fire doors.* ~~assemblies when tested as components of the door assemblies, and not as glass lights, and shall have a maximum transmitted temperature rise of 450o F (250o C) in accordance with Section 716.5.5.~~ Fire doors using listed fire-resistance-rated glazing shall have a maximum transmitted temperature rise in accordance with Section 716.5.5 when tested in accordance NFPA 252, UL 10B or UL 10C.

Reason: This proposal is not intended to change the underlying requirements of section 716.5.5.1. It is intended to provide uniformity for testing fire-resistance-rated glazing when it is used in temperature rise fire doors.

When glazing in temperature rise fire doors exceeds 100 sq. in., it must be fire-resistance-rated glazing. An issue arises as to the sequence of testing when fire-resistance-rated glazing is used in a fire door because fire-resistance-rated glazing is tested to ASTM E119 and the fire door is tested to NFPA 252. Working closely with UL, this code change proposal was developed to answer the question as to how to test a fire door when it uses fire-resistance-rated glazing. In that regard, the proposal would require the glazing to be tested first, and, if it meets the ASTM E119 acceptance criteria, it is listed as a fire-resistance-rated glazing. That "listed fire-resistance rated glazing" is then installed in a fire door and tested in accordance with NFPA 252, the fire door test, including tests for the maximum transmitted temperature rise requirements of Section 716.5.5.

If adopted, this proposal will provide uniformity for testing ASTM E119 fire-resistance-rated glazing when used in NFPA 252 tested fire doors.

Cost Impact: The code change proposal will not increase the cost of construction.

FS91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.5.1-FS-ZAREMBA

FS92 – 12
716.5.7.1.1

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

716.5.7.1.1 Light kits, louvers and components. Listed light kits and louvers and their required preparations shall be considered as part of the labeled door where such installations are done under the listing program of the third-party agency. ~~Where tested for such use,~~ *Fire doors* and door assemblies shall be permitted to consist of components, including glazing, vision light kits and hardware that are listed and labeled~~, listed or classified~~ for such use by different third-party agencies.

Reason: This proposal clarifies that the evidence a combination of components have been tested for such use is listing and labeling.

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Cost Impact: None

FS92-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.7.1.1-FS-EUGENE

FS93 – 12

716.5.7.5 (New)

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Won-Door Corporation (wkoffel@koffel.com)

Revise as follows:

<u>**716.5.7.5 Fire door operator labeling requirements.** Fire door operators for horizontal sliding doors shall be labeled and listed for use with the assembly</u>

Reason: Section 716.5 requires fire door assemblies to be installed in accordance with NFPA 80. NFPA 80 requires fire door operators to be listed for use with the door. As such, the proposed new text is already required by NFPA 80. However, it can easily be overlooked or confusion may occur as to whether this specific requirement in NFPA 80 applies since Section 716.5.7 requires specific components to be labeled but does not include the operator for horizontal sliding doors.

Cost Impact: None

FS93-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.7.5 (NEW)-KOFFEL

FS94 – 12
716.5.8, 716.5.8.1, 716.5.8.1.2.1, 716.5.8.3

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

716.5.8 Glazing material. Fire~~-protection~~-rated glazing conforming to the opening protective requirements in Section 716.5 shall be permitted in *fire door* assemblies.

716.5.8.1 Size limitations. <u>Fire-resistance-rated glazing shall comply with the size limitations in Section 716.5.8.1.1</u>. Fire-protection-rated glazing shall comply with the size limitations of NFPA 80, except as provided in Section~~s 716.5.8.1.1 and~~ 716.5.8.1.2.

716.5.8.1.1 Fire-resistance-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1 hour. Fire-resistance-rated glazing tested to ASTM E 119 or UL 263 and NFPA 252, UL 10B or UL 10C shall be permitted in *fire door assemblies* located in *fire walls* and in *fire barriers* in accordance with Table 716.5 to the maximum size tested in accordance with their listings.

716.5.8.1.2 Fire-protection-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1 hour. Fire-protection-rated glazing shall be prohibited in *fire walls* and *fire barriers* except as provided in Sections 716.5.8.1.2.1 and 716.5.8.1.2.2.

716.5.8.1.2.1 Horizontal exits. Fire-protection-rated glazing shall be permitted as vision panels in *self-closing* swinging *fire door* assemblies serving as horizontal exits in *fire walls* where limited to 100 square inches (0.065 m^2) with no dimension exceeding 10 inches (0.3 m~~m~~).

716.5.8.1.2.2 Fire barriers. Fire-protection-rated glazing shall be permitted in *fire doors* having a 1-1/2-hour *fire protection rating* intended for installation in *fire barriers*, where limited to 100 square inches (0.065 m^2).

716.5.8.2 Elevator, stairway and ramp protectives. Approved fire-protection-rated glazing used in *fire door* assemblies in elevator, stairway~~s~~ and ramp~~s~~ enclosures shall be so located as to furnish clear vision of the passageway or approach to the elevator, stairway or ramp.

716.5.8.3 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section ~~716.5.8.3.1~~ <u>Table 716.3</u> that shall be issued by an *approved agency* and shall be permanently identified on the glazing.

Reason: The charging language of Section 716.5.8 references fire-protection-rated glazing. The sub sections which follow detail requirements for both fire-protection-rated glazing and fire-resistance-rated glazing. The proposed changes to Section 716.5.8 editorially correct this along with several other typographical errors. No technical changes are being introduced.

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Cost Impact: None

FS94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.8-FS-EUGENE

FS95 – 12
716.5.8.4, 716.6.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.5.8.4 Safety glazing. Fire~~-protection-~~rated glazing installed in *fire doors* assemblies ~~in areas subject to human impact in hazardous locations~~ shall also comply with the safety glazing requirements of Chapter 24 where applicable.

716.6.3 Safety glazing. Fire~~-protection-~~rated glazing installed in *fire window assemblies* ~~in areas subject to human impact in hazardous locations~~ shall also comply with the safety glazing requirements of Chapter 24 where applicable.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/CTC/Pages/default.aspx. Since its inception in April/2005, the CTC has held twenty two meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Labeling of Fire Rated Glazing". The scope of the activity is noted as:

Identify root causes of problems selecting, specifying, installing, and inspecting fire protective and fire resistive glazing and other assembly components including the frames. Propose identification requirements and other related code changes.

The proposed changes to Section 716.5.8.4 and 716.6.3 are needed to clarify the code changes approved in the last code cycle to ensure that there is no question that Chapter 24 language covers both fire-protection-rated glazing and fire-resistance-rated glazing. Proposed language also addresses requirements for safety glazing not defined as hazardous locations by referencing compliance with Chapter 24. No technical changes are being introduced.

Cost Impact: The code change proposal will not increase the cost of construction.

FS95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.8.4-FS-BALDASSARRA-CTC

FS96 – 12
716.5.9

Proponent: Sharon S. Gilyeat, Koffel Associates, Inc., representing CHUTES International

Revise as follows:

716.5.9 Door closing. Fire doors shall be self- or automatic-closing in accordance with this section. ~~Self-closing chute intake doors shall not fail in a "door open" position in the event of a closer failure.~~

Exceptions:

1. Fire doors located in common walls separating sleeping units in Group R-1 shall be permitted without automatic- or self-closing devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.

Reason: In the last code cycle this change was made as part of FS 39. In my review of the documentation relating to the change, it appears that the proposal was attempting to ensure the door stayed closed and latched even if the closer was broken. In other words, the closer could not be the device keeping the door shut, the latch needed to do this. The changes that ultimately went into 715.4.8.1.1 accomplished this goal. It does not appear that it was intended for there be multiple door closing devices on the door.

It is not possible to have a chute door fail safe to the closed position if the self-closer is broken and the door is open at the time the closer fails. It is the closer that brings the door to the closed position. If this requirement were taken literally, it would require all intake doors to be top hinged. For safety reasons this is not acceptable as the doors are generally arranged to minimize the risk of someone falling into the chute inadvertently. This is why side or bottom hinged doors are used as loading doors. I believe this requirement is unclear. It is attempting to address a maintenance and inspection issue by adding more hardware.

Cost Impact: The code change proposal will not increase the cost of construction.

FS96-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.9-FS-GILYEAT

FS97 – 12
716.5.9.3

Proponent: Sharon S. Gilyeat, Koffel Associates, Inc., representing CHUTES International

Revise as follows:

716.5.9.3 Smoke-activated doors. Automatic-closing doors installed in the following locations shall be automatic-closing by the actuation of smoke detectors installed in accordance with Section 907.3 or by loss of power to the smoke detector or hold-open device. Doors that are automatic-closing by smoke detection shall not have more than a 10-second delay before the door starts to close after the smoke detector is actuated:

1. Doors installed across a corridor.
2. Doors that protect openings in exits or corridors required to be of fire-resistance-rated construction.
3. Doors that protect openings in walls that are capable of resisting the passage of smoke in accordance with Section 509.4.
4. Doors installed in smoke barriers in accordance with Section 709.5.
5. Doors installed in fire partitions in accordance with Section 708.6.
6. Doors installed in a fire wall in accordance with Section 706.8.
7. Doors installed in shaft enclosures in accordance with Section 713.7.
8. Doors installed in ~~refuse and laundry~~ waste and linen chutes, discharge openings, and access and ~~termination~~ discharge rooms in accordance with Section 713.13. ~~Automatic-closing~~ Chute ~~intake~~ loading doors installed in ~~refuse and laundry~~ waste and linen chutes shall also meet the requirements of Section 716.5.9 and 716.5.9.1.1.
9. Doors installed in the walls for compartmentation of underground buildings in accordance with Section 405.4.2.
10. Doors installed in the elevator lobby walls of underground buildings in accordance with Section 405.4.3.
11. Doors installed in smoke partitions in accordance with Section 710.5.2.3.

Reason: Editorial changes intended to use consistent terms throughout the ICC that correlate with NFPA 82. This change corresponds with the related change to 713.13.1. The industry standard is for the loading doors to remain normally closed and in the case of linen, to be secured. Allowing a loading door to a chute to be held open creates a safety risk. The risk of someone falling into the chute inadvertently is minimized by the door being normally closed.

Cost Impact: The code change proposal will not increase the cost of construction.

FS97-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.9.3-FS-GILYEAT

FS98 – 12
716.5.9.3

Proponent: Philip Brazil, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

716.5.9.3 Smoke-activated doors. Automatic-closing doors installed in the following locations shall be automatic- closing by the actuation of smoke detectors installed in accordance with Section 907.3 or by loss of power to the smoke detector or hold-open device. Doors that are automatic-closing by smoke detection shall not have more than a 10-second delay before the door starts to close after the smoke detector is actuated:

1. Doors installed across a *corridor*.
2. Doors that protect openings in *exits* or *corridors* required to be of fire-resistance-rated construction.
3. Doors that protect openings in walls that are capable of resisting the passage of smoke in accordance with Section 509.4.
4. Doors installed in *smoke barriers* in accordance with Section 709.5.
5. Doors installed in *fire partitions* in accordance with Section 708.6.
6. Doors installed in a *fire wall* in accordance with Section 706.8.
7. Doors installed in shaft enclosures in accordance with Section 713.7.
8. Doors installed in refuse and laundry chutes and access and termination rooms in accordance with Section 713.13. Automatic-closing chute intake doors installed in refuse and laundry chutes shall also meet the requirements of Sections 716.5.9 and 716.5.9.1.1.
9. Doors installed in the walls for compartmentation of underground buildings in accordance with Section 405.4.2.
10. Doors installed in the elevator lobby walls of underground buildings in accordance with Section 405.4.3.
11. Doors installed in smoke partitions in accordance with Section 710.5.2.3.
12. <u>Doors installed in the enclosures of *exit access stairways* and *ramps* in accordance with Sections 1009.3.1.4 and 1010.2, respectively.</u>

Reason: The addition of Item 12 is for correlation with the reference to Section 716.5.9.3 in Section 1009.3.1.4 for exit access stairways and, by inference, in Section 1010.2 for exit access ramps, which specifies compliance with Section 1009.3 for enclosure of stairways.

Cost Impact: The code change proposal will not increase the cost of construction.

FS98-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.9.3-FS-BRAZIL

FS99 – 12

202, 712.1.3.3 (New), 717 (New)

Proponent: Tom Meyer, Colorado Code Consulting, LLC, representing Stobich Fire Protection (tmeyers@coloradocode.net); Steve Thomas, Colorado Code Consulting, LLC, representing Stobich Fire Protection (sthomas@coloradocode.net)

THIS IS A 5 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC FIRE SAFETY

Add new definition as follows:

Fire Curtain. A flexible membrane assembly constructed of materials designed to restrict the spread of fire when tested in accordance with UL 10D.

Add new text as follows:

SECTION 717
FIRE AND SMOKE CURTAINS

717.1 General. Fire and smoke curtains permitted by other sections of this code shall comply with the provisions of this section.

717.2 Fire Test Criteria. Fire and smoke curtains shall be tested in accordance with the requirements of UL 10D.

717.3 Activation. Fire and smoke curtains shall comply with the following criteria:

1. Fire and smoke curtains shall be actuated by approved spot-type detectors listed for releasing service.
2. Fire detection systems providing control input or output signals to fire and smoke curtains or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.

(Renumber subsequent sections)

Add new standard to Chapter 35 as follows:

UL 10D-09 Outline of Investigation for Fire Tests for Fire Protective Curtains

PART II – IBC FIRE SAFETY

Add new text as follows:

712.1.3.3 Fire Curtains. Protection of the opening by approved fire curtains in accordance with Section 717 at every penetrated floor shall be permitted in accordance with this section. The curtain shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the curtain begins to close. The curtain shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.

PART III – IBC FIRE SAFETY

Add new text as follows:

721.1.18 Fire Curtains. Vertical floor openings shall be permitted where protected by a fire curtain in accordance with Section 717. Fire curtains shall achieve a fire-resistance rating not less than the assembly being penetrated, but need not exceed 2 hours.

(Renumber subsequent sections)

PART IV – IBC GENERAL

Revise as follows:

404.6 Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

Exception: A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:

1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;
   - 1.1. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
   - 1.2. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic-closing.
2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a 3/4-hour fire protection rating is provided.
3. A fire barrier is not required between the atrium and the adjoining spaces of any three floors of the atrium provided such spaces are accounted for in the design of the smoke control system.
4. A fire barrier is not required between the atrium and the adjoining spaces when a fire curtain having a one-hour fire-resistance rating in accordance with Section 717 is installed at the perimeter of the atrium opening. The curtain shall not be placed in such a location as to obstruct the means of egress.

PART V – IBC MEANS OF EGRESS

Add new definition as follows:

1009.3 Exit access stairways. Floor openings between stories created by exit access stairways shall be enclosed.

Exceptions:

(No changes to Exceptions 1 through 10)

11. In other than Group I-2 and I-3 occupancies, stairways that serve, or atmospherically communicate between only four stories, and are not part of the required means of egress shall be permitted to be enclosed by a fire curtain installed in accordance with Section 717.

Reason: This proposal introduces fire curtains into the code to be used in protecting vertical openings. A new section has been proposed to address the requirements for a fire curtain in a new Section 717. The current code has several different ways to protect these openings. These curtains have been tested in accordance with UL 10D which is similar to UL 263 without the hose stream test. Horizontal assemblies are not required to pass the hose stream test. Therefore, the standards are similar in how they evaluate the system. The proposal is also creating a new definition to address the testing and installation requirements for the curtain. UL 10D has been specified as the test standard for the fire curtains. It is similar to other fire-resistance tests with the exception of a hose stream test.

Section 712.1.2 currently permits the installation of a draft curtain and closely spaced automatic sprinklers in lieu of providing a fire-resistant rated shaft enclosure. The intent of this requirement is to limit the amount of smoke and heat that can extend up through the opening created for an escalator. This proposal is intended to provide a third option to the designer to address the floor openings created by an escalator. The installation of a fire curtain is being presented as that option. A fire curtain can meet the requirement of a fire rated assembly, but has not been tested with a hose stream. A fire curtain will provide an equal level of protection, if not better, than the current draft curtain and sprinklers.

Section 721.1.18 would permit a horizontally deployed curtain that would enclose the vertical floor opening and provide the same protection as the horizontal assembly.

Section 404.6 requires that an atrium be separated from other spaces of the building by a one-hour fire barrier. The exceptions to that requirement permit the installation of a non-fire rated assembly in exception 1. The proposal permits the installation of a fire curtain around the perimeter of the atrium as an additional option. A fire curtain provides an equivalent level of protection to glass forming a smoke partition protected by automatic sprinklers outlined in exception 1. The intent of the exception is to provide a smoke separation at the atrium.

Section 1009.3 presents a new type of separation requirement for exit access stairways. It introduces the concept of fire curtains into the code and permits their use to enclose exit access stairs that serve a maximum of four stories. Fire curtains are tested to UL 10D which does not include the hose stream test. The intent is to allow an alternative to a full enclosure. The current code permits stairs to be open between adjacent stories without enclosure. This proposal is also consistent with the protection that Exceptions 3 and 4 of Section 1009.3 provides, with the draft curtain and closely spaced sprinklers.

Cost Impact: This change will reduce the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, UL10D-09 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS99-12
PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART V – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

712.1.3.3 (NEW)-FS-MEYERS-THOMAS-721.1.18 (NEW)-FS-MEYERS-THOMAS-404.6-FS-MEYERS-THOMAS-1009.3-FS-MEYERS-THOMAS

FS100 – 12
714.1.1 (New)

Proponent: Clay Aler, P.E., Koffel Associates, representing self

Add new text as follows:

717.1 General. The provisions of this section shall govern the protection of duct penetrations and air transfer openings in assemblies required to be protected and duct penetrations in nonfire-resistance-rated floor assemblies.

<u>**717.1.1 Ducts and Air Transfer Openings.** Ducts transitioning horizontally between shafts shall not require a shaft enclosure provided that the duct penetration into each associated shaft is protected with *dampers* complying with the this section.</u>

Reason: The code intent is to maintain the integrity of shaft enclosures when they are provided. The code intent is maintained by providing dampers in accordance with Section 717. The code intent is not to require a continuous shaft enclosure of main ducts where adequate protection of the individual shaft enclosures is maintained. The overriding intent is to maintain appropriate separation between stories within an enclosed building and to minimize the spread of fire and smoke through the use of dampers as ductwork leaves a shaft enclosure. Providing a continuous horizontal shaft enclosure with required supporting construction will have significant cost implications.

Cost Impact: The proposed code language will allow the designer to determine the approach taken to protect ductwork that must transition horizontally between shaft enclosures that are not continuous through all stories of a building. Designers choosing to provide dampers at each duct penetration of the associated discontinuous shaft enclosures should see a reduction in construction cost

FS100-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.1.1-FS-ALER – 714.1.1-FS-ALER

FS101 – 12
717.2 (IMC 607.2)

Proponent: Umesh Kumar Bhargava, PE., Bhargava International, Inc., representing self

Revise as follows:

717.2 (IMC 607.2) Installation. *Fire dampers, smoke dampers, combination fire/smoke dampers* and *ceiling radiation dampers* located within air distribution and smoke control systems shall be installed in accordance with the requirements of this section, the manufacturer's installation instructions and the *dampers*' listing.

Exceptions:

1. The duct shall not exceed 7-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m^2) in any 100 square feet (9.3 m^2) of floor area.
2. Duct shall be metallic thickness minimum 20 gauge, Where duct length exceeds 3 feet on either side of membrane penetration, duct shall be minimum 20 gauge up to 3 feet on either side of membrane penetration.
3. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
4. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
5. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.
6. Grille openings located in a ceiling of a fire-resistance- rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 717.6.2.1.

Reason:
1. Fire dampers are available from any manufacturer for ceiling membrane penetration
2. Ceiling radiation dampers are applicable for thru penetration
3. Currently due to lack of fire damper or ceiling radiation damper availability, most authorities having jurisdiction officials are reluctantly permitting fire dampers, while admitting it is not correct application.
4. Metalic duct with fire stop system should provide protection

Cost Impact: None

FS101-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.2-FS-BHARGAVA

FS102 – 12
717.1.2 (New) [(IMC607.1.2 (New))] , 717.5.2 (IMC 607.5.2), Chapter 35

Proponent: John D. Nicholas, Perceptive Solutions LLC, representing Unifrax I LLC (john@perceptivesolutionsllc.com)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC FIRE SAFETY

Add new text as follows:

717.1.2 (IMC 607.1.2) Ducts that penetrate fire-resistance-rated assemblies. Ducts tested and *listed* in accordance with ASTM E2816 having a fire-resistance rating equal to the construction being penetrated that protect horizontal ducts penetrating fire-resistance-rated vertical assemblies or that protect vertical ducts or both are not required to have fire dampers.

Add new standard to Chapter 35 as follows:

ASTM
E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

PART II – IBC FIRE SAFETY

Revise as follows:

717.5.2 (IMC 607.5.2) Fire barriers. Ducts and air transfer openings of *fire barriers* shall be protected with *approved fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for stairways, ramps and exit passageways except as permitted by Sections 1022.4 and 1023.6, respectively.

> **Exception:** *Fire dampers* are not required at penetrations of *fire barriers* where any of the following apply:
>
> 1. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly.
> 2. Ducts are used as part of an approved smoke control system in accordance with Section 909 and where the use of a fire damper would interfere with the operation of a smoke control system.
> 3. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.
> 4. Ducts tested and *listed* in accordance with ASTM E2816 having a fire-resistance rating equal to the type of building construction being penetrated.

Add new standard to Chapter 35 as follows:

ASTM
E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Reason: This proposal allows another means to provide fire protection in lieu of fire dampers when the duct complies with *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.* The level of fire protection offered by the proposal is typically greater than currently required by Table 717.3.2.1 for fire dampers. For example, a typical 2-hour fire-resistance rated construction only requires a fire damper having a 1-1/2-hour fire-resistance rating. The duct will maintain the same fire-resistance rating of the building construction being penetrated by the duct. Further, the duct will provide an insulation (temperature) rating where the fire damper is only required to provide an integrity (flame) rating.

These proposed code changes allow for the use of either a pre-fabricated duct system or field applied enclosure system. *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* is a full consensus test method that was specifically designed to assess both specific end use of the ductwork and its protection materials.

ASTM E2816-11 provides tests for all four (4) possible duct system's configurations: Conditions A, B, C, and D. The application of these Conditions can be applied to specific types of duct system's use within a building. ASTM E2816 uses the ASTM E119 time-temperature curve and replicates use of exhaust by using a fan technique to create a negative pressure within the duct similar to that occurring while a cloth's drier exhaust system is in use. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts. In ASTM E2816, the systems supports are also tested as part of the fire resistance test. ASTM E2816 offers the following tests to assess performance:

This method of tests uses the ASTM E119 time-temperature curve to test the ductwork and the enclosure materials. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts.

ASTM E2816 References
1.4.1 *Condition A*—These test methods provide a means for evaluating a **horizontal** HVAC duct system, **without openings** exposed to fire, passing through a vertical fire-separating element.
1.4.2 *Condition B*—These test methods provide a means for evaluating a **vertical** HVAC duct system, **without openings** exposed to fire and outfitted with a horizontal connection, passing through a horizontal fire-separating element.
1.4.3 *Condition C*—These test methods provide a means for evaluating a **horizontal** HVAC duct system, **with unprotected openings** exposed to fire, passing through a vertical fire-separating element.
1.4.4 *Condition D*—These test methods provide a means for evaluating a **vertical** HVAC duct system with a horizontal connection, and **with unprotected openings** exposed to fire, passing through a horizontal fire-separating element.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. ASTM E2816-11 also contains provisions for testing other service attributes of the duct system. ASTM E84 is used for the system's flame spread and smoke developed indices: ASTM E136 is used for insulation's non-combustibility: ASTM C518 is used for the insulation's durability: ASTM E814 is used for the system's ability as a firestop to prevent the spread of fire from compartment to compartment: ASTM E2226 is used for the resistance to the application of a hose stream: and ASTM C411 is used for the insulation covering's and lining's ability to resist flaming, glowing, smoldering or smoking while in service, which was just approved in December 2011 and this test method will also become part of the standard upon its latest publication.

ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* cites ASTM E2816-11 to establish requirements for fire protection enclosure systems, applied to metallic HVAC ducts, which provide an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations, as well as to determine the characteristics of the system and enclosure material currently cited in the codes. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting multiple stories

These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2816 who drafted its first version, as the proponent of the latest approved revisions to ICC ES AC179 *Acceptance*

Criteria For Metallic HVAC Duct Enclosure Assemblies, as the ANSI Designated Expert to ISO TC92 Fire SC2 Fire Resistance WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 1: Ventilation Ducts* and one who has designed, supervised, and overseen HVAC fire tests as a member of an international laboratory as well as the one who had jurisdiction over the product certification process for products and materials.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: FS 102, Part I and FS103 provide provisions for duct penetrations of fire rated assemblies. Also, FS 102, Part II and FS 109 provide similar provisions for ducts penetrating fire barriers. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS102
-12

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D

Assembly: ASF AMF DF

FS103-12

717.1.2 (New) [(IMC 607.1.2 (New))], Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Add new text as follows:

717.1.2 (IMC 607.1.2) Ducts that penetrate fire-resistance-rated assemblies. Fire dampers are not required in vertical or horizontal HVAC ducts penetrating vertical fire resistance-rated assemblies provided the duct system complies with the requirements of ASTM E2816-11,

Add new standartd to Chapter 35 as follows:

ASTM
E2816-11 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal permits an additional exception to the requirement to install fire dampers in duct and air transfer openings through fire barriers provided the HVAC ducts are protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose. This ASTM test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of the acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This proposal mirrors the AC 179 acceptance criteria, which provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting multiple stories.

The test method evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to other compartments separated by a fire resistance rated construction when the HVAC duct system is exposed to fire under one or more of the following conditions:

Condition A — Fire exposure from the outside of the horizontal HVAC duct system without openings,
Condition B — Fire exposure from the outside of the vertical HVAC duct system without openings,
Condition C — Fire exposure from the outside with hot gases entering the inside of the horizontal HVAC duct system with unprotected openings, and
Condition D — Fire exposure from the outside with hot gases entering the inside of the vertical HVAC duct system with unprotected openings.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment when subjected to the standard time-temperature curve of ASTM E119.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: FS 102, Part I and FS103 provide provisions for duct penetrations of fire rated assemblies.The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.2.1 (NEW)-FS-CRIMI

FS104–12
717.3.1 (IMC 607.3.1)

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

717.3.1 (IMC 607.3.1) Damper testing. *Dampers* shall be listed and labeled in accordance with the standards in this section*.* *Fire dampers* shall comply with the requirements of UL 555. Only *fire dampers* and ceiling radiation dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. *Smoke dampers* shall comply with the requirements of UL 555S. *Combination fire/smoke dampers* shall comply with the requirements of both UL 555 and UL 555S. *Ceiling radiation dampers* shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263.

Reason: The code currently requires ceiling radiation dampers to comply with the requirements of the 2006 edition of UL 555C, with revisions through May 2010, which includes performance requirements for ceiling radiation dampers intended for use in dynamic HVAC systems where the airflow is operational at the time of a fire. The UL 555C standard requires ceiling radiation dampers investigated for use in dynamic systems to be marked for dynamic system use, along with the established airflow and closure pressure. This proposal will require the use of ceiling radiation dampers labeled for use in dynamic systems in these applications.
.
Cost Impact: None

FS104-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.3.1-FS-EUGENE

FS105 – 12
202 (New), 717.3.1 (IMC 607.3.1), 717.3.3.5 (New) [(IMC 607.3.3.5 (New)]

Proponent: Vickie Lovell, InterCode Incorporated representing AMCA International (vickie@intercodeinc.com)

Add new definition as follows:

COMBINATION CEILING RADIATION/SMOKE DAMPER. A *listed* device installed in a ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly designed to close *automatically* upon the detection of heat and resist the passage of heat and smoke. The device is installed to operate *automatically*, controlled by a smoke detection system, and where required, is capable of being positioned from a *fire command center*.

Revise as follows:

717.3.1 (IMC 607.3.1) Damper testing. *Dampers* shall be listed and labeled in accordance with the standards in this section. *Fire dampers* shall comply with the requirements of UL 555. Only *ceiling radiation dampers* labeled for use in dynamic systems or *fire dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. *Smoke dampers* shall comply with the requirements of UL 555S. *Combination fire/smoke dampers* shall comply with the requirements of both UL 555 and UL 555S. *Ceiling radiation dampers* shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263.

717.3.3.5 (IMC 607.3.3.5) Combination ceiling radiation/smoke damper actuation*: Combination ceiling radiation damper/smoke damper* actuation shall be in accordance with Sections 717.3.3.2 and 717.3.3.4.

Reason: This proposed code change clarifies that ceiling radiation dampers installed in HVAC systems where fans remain on during a fire must be labeled for use in dynamic systems to attest to the their ability to close under heated airflow conditions.
The 2012 IBC requires HVAC penetrations in the ceiling membrane of a rated floor ceiling assembly to be both a ceiling radiation damper and a smoke damper. For example, a fire rate corridor where the ceiling membrane is part of rated floor/ceiling assembly and the penetration is not protected by a shaft. In this example, IBC Section 717.6.2 requires a ceiling radiation damper where the duct opening penetrates the ceiling membrane **and** IBC Section 717.5.4.1 requires a smoke damper where the duct penetrates the corridor enclosure.

One solution for these situations is to provide a separate ceiling radiation damper and a separate smoke damper. The other solution is to provide a single combination ceiling radiation/smoke damper that meets the requirements of both a ceiling radiation damper and a smoke damper.

This code change clarifies that when a combination ceiling radiation/smoke damper is used it shall comply with the actuation requirements of **both** the ceiling radiation damper **and** the smoke damper.

Cost Impact: The code change proposal will not increase the cost of construction.

FS105-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.3.1-FS-LOVELL

FS106 – 12

202, 702.1, 717.3.1, 717.3.2.4 (new), 717.3.3.5 (New), 717.5, 717.5.4.1

Proponent: Bob Eugene representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

SECTION 202
DEFINITIONS

CORRIDOR DAMPER. A listed device intended for use where air ducts penetrate or terminate at horizontal openings in the ceilings of interior corridors, where the corridor ceiling is constructed as required for the corridor walls.

DAMPER. See "*Ceiling radiation damper*," "*Combination fire/smoke damper*," "*Corridor damper*," "*Fire damper*" and "*Smoke damper*."

Revise text as follows:

702.1 Definitions. The following terms are defined in Chapter 2:
CORRIDOR DAMPER

(Portions of text not shown remain unchanged)

717.3.1 Damper testing. Dampers shall be listed and labeled in accordance with the standards in this section.

1. Fire dampers shall comply with the requirements of UL 555. Only fire dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.
2. Smoke dampers shall comply with the requirements of UL 555S.
3. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S.
4. Ceiling radiation dampers shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263.
5. Corridor dampers shall comply with requirements of both UL 555 and UL 555S. Corridor dampers shall also demonstrate acceptable closure performance when subjected to 150 fpm (0.76 mps) velocity across the face of the damper during the UL 555 fire exposure test.

717.3.2.4 Corridor damper ratings. Corridor dampers shall have the following minimum ratings:

1. One hour fire-resistance rating,
2. Class I or II leakage rating as specified in Section 717.3.2.2.

717.3.3.5 Corridor damper actuation. Corridor *damper* actuation shall be in accordance with Sections 717.3.3.1 and 717.3.3.2.

717.5 Where required. *Fire dampers*, *smoke dampers*, ~~and~~ *combination fire/smoke dampers*, *ceiling radiation dampers* and *corridor dampers* shall be provided at the locations prescribed in Sections 717.5.1 through 717.5.7 and 717.6. Where an assembly is required to have both *fire dampers* and *smoke dampers, combination fire/smoke dampers* or a *fire damper* and a *smoke damper* shall be ~~required~~ provided.

717.5.4.1 Corridors. Duct and air transfer openings that penetrate corridors shall be protected with dampers as follows.

1. <u>A corridor damper shall be provided where corridor ceilings, constructed as required for the corridor walls as permitted in Section 708.4, Exception 3, are penetrated.</u>
2. <u>A ceiling radiation damper shall be provided where the ceiling membrane of a fire-resistance-rated floor-ceiling or roof-ceiling assembly, constructed as permitted in Section 708.4, Exception 2, is penetrated.</u>
3. A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *corridor* enclosure required to have smoke and draft control doors in accordance with Section 716.5.3.

   Exceptions:

   1. *Smoke dampers* are not required where the building is equipped throughout with an approved smoke control system in accordance with Section 909, and *smoke dampers* are not necessary for the operation and control of the system.
   2. *Smoke dampers* are not required in corridor penetrations where the duct is constructed of steel not less than 0.019 inch (0.48 mm) in thickness and there are no openings serving the corridor.

Reason: This proposal clarifies the appropriate types of dampers required to protect duct and air transfer openings that penetrate corridors. It accomplishes this as follows.

1. A new definition of corridor damper is proposed. These products have been around for several years, and 18 companies currently have corridor damper Listings.
2. IBC section 717.3.1 and 717.3.2.4 (IMC 607.3.1 and 607.3.2.4) describe the testing standards and ratings that corridor dampers must meet. Corridor dampers are listed for both a fire resistance rating of 1 hr, and a Class I or II leakage rating as defined by the Standard UL 555S. Leakage ratings of corridor dampers are determined at an elevated temperature 250°F or 350°F. Corridor dampers have also demonstrated acceptable closure performance when subjected to 150 fpm velocity across the face of the damper during fire exposure. Corridor dampers are only intended to be used to protect duct and air transfer openings in corridor ceilings, where the ceilings are constructed as required for the corridor walls (as permitted in Section 708.4, Exception 3.)
3. Section 717.3.3.5 (IMC 607.3.3.5) cover the actuation criteria for corridor dampers using existing criteria for both fire dampers and smoke dampers.
4. Language was added to Section 717.5.4.1 (IMC 607.5.4) describing the applications that require corridor dampers to be installed. Additional language was also added to indicate the applications in which a ceiling radiation damper is required to be installed, which was not covered in the current code.

Currently, Section 717.5.4.1, in conjunction with Sections 717.5.4 and/or 717.6.1, would imply these penetrations should be protected with combination fire/smoke dampers or fire dampers and smoke dampers. However, these devices are not designed and tested to be mounted in a wall installed in the horizontal orientation. The correct devices for this application are corridor dampers.

Cost Impact: None

Analysis: FS 106 and FS 107 provide similar provisions for corridor dampers. The committee needs to make its intent clear with respect to these provisions.

FS106-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CORRIDOR DAMPER (NEW)-G-EUGENE

FS107– 12

202, 717.3.2.4 (New) [IMC 607.3.2.4 (New)], 717.3.3 (IMC 607.3.3), 717.3.3.5 (New) [IMC 607.3.3.5 (New)], 717.5 (IMC 607.5), 717.5.4.1 (IMC 607.5.4)

Proponent: Joe Pierce, Dallas Fire Department, TX, representing the ICC Fire Code Action Committee

Revise as follows:

CORRIDOR DAMPER. A listed device intended for use where air ducts penetrate or terminate at horizontal openings in the ceilings of interior corridors, and where the corridor ceiling is constructed as required for the corridor walls.

DAMPER. See "Ceiling radiation damper," "Combination fire/smoke damper," "Corridor damper," "Fire damper" and "Smoke damper."

Revise as follows:

717.3.2.4 (IMC 607.3.2.4) Corridor dampers ratings. Corridor dampers shall be listed in accordance with applicable requirements in UL 555 and UL 555S for all of the following:

1. A minimum one-hour fire-resistance rating,
2. A Class I or II leakage rating established at an elevated temperature of minimum 250°F,
3. Acceptable closure performance when subjected to 150 fpm velocity across the face of the damper during fire exposure.

717.3.3 (IMC 607.3.3) Damper actuation. Damper actuation shall be in accordance with Sections 717.3.3.1 through ~~717.3.3.4~~ 717.3.3.5 as applicable.

717.3.3.5 (IMC 607.3.3.5) Corridor damper actuation. Corridor dampers shall close upon actuation of the fire damper actuation device in accordance with Section 717.3.3.1 or upon actuation of a listed smoke detector or detectors installed in accordance with Section 907.3 and one of the following methods, as applicable:

1. By a smoke detector installed in the duct within 5 feet (1524 mm) of the corridor damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. By a smoke detection system installed in the corridor.
3. Where a total-coverage smoke detection system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, corridor dampers shall be permitted to be controlled by the smoke detection system.

717.5 (IMC 607.5) Where required. *Fire dampers*, *smoke dampers*, ~~and~~ *combination fire/smoke dampers*, *ceiling radiation dampers* and *corridor dampers* shall be provided at the locations prescribed in Sections 717.5.1 through 717.5.7 and 717.6. Where an assembly is required to have both *fire dampers* and *smoke dampers*, *combination fire/smoke dampers* or a *fire damper* and a *smoke damper* shall be required.

717.5.4.1 (IMC 607.5.4) Corridors. A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a corridor enclosure required to have smoke and draft control doors in accordance with Section 716.5.3.

Exceptions:

1. *Smoke dampers* are not required where the building is equipped throughout with an approved smoke control system in accordance with Section 909, and *smoke dampers* are not necessary for the operation and control of the system.
2. *Smoke dampers* are not required in corridor penetrations where the duct is constructed of steel not less than 0.019 inch (0.48 mm) in thickness and there are no openings serving the corridor.
3. <u>Smoke dampers are not required in corridor ceilings constructed as permitted in Section 708.4, Exception 3, provided the openings are protected with listed corridor dampers installed in accordance with their listings.</u>

Reason: The IBC does not mention listed corridor dampers. UL 555 and UL 555S both evaluate dampers for installation in corridor ceilings and are titled "corridor dampers". These dampers are listed specifically for this purpose.

IBC Section 202 is revised to include the definition of "corridor damper" and correlate the definition of "damper".

Section 717.3.2.4 is added to specify the performance requirements for ceiling dampers. Dampers are required to be listed as meeting UL 555 or UL 555S and meet specific testing criteria.

Section 717.3.3 is revised to include the new section in the referenced sections.

Section 717.3.3.5 is added to provide specific language for actuation of the corridor damper.

Section 717.5 is revised to include the reference to corridor dampers, and include ceiling radiation dampers which are not included.

Section 717.5.4.1 is revised to add the requirement to use corridor dampers when the corridor ceiling is constructed as part of the fire partition for the corridor. This is the appropriate location for the corridor dampers to be installed.

Cost Impact: The code change will not increase the cost of construction.

Analysis: FS 106 and FS 107 provide similar provisions for corridor dampers. The committee needs to make its intent clear with respect to these provisions.

FS107-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.3.2.4-FS-PIERCE-FCAC

FS108 – 12
717.3.3.2 (IMC 607.3.3.2)

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

717.3.3.2 (IMC 607.3.3.2) Smoke damper actuation. The *smoke damper* shall close upon actuation of a *listed* smoke detector or detectors installed in accordance with Section 907.3 and one of the following methods, as applicable:

1. Where a *smoke damper* is installed within a duct, a smoke detector installed in the duct, or smoke detector installed outside the duct with sampling tubes protruding into the duct, shall be installed ~~in the duct~~ within 5 feet (1524 mm) of the *damper* with no air outlets or inlets between the detector and the *damper*. The detector shall be *listed* for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, *dampers* shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. Where a *smoke damper* is installed above *smoke barrier* doors in a *smoke barrier*, a spot-type detector ~~*listed* for releasing service~~ shall be installed on either side of the *smoke barrier* door opening. The detector shall be listed for releasing service if used for direct interface with the damper.
3. Where a *smoke damper* is installed within an air transfer opening in a wall, a spot-type detector ~~*listed* for releasing service~~ shall be installed within 5 feet (1524 mm) horizontally of the *damper*. The detector shall be listed for releasing service if used for direct interface with the damper.
4. Where a *smoke damper* is installed in a *corridor* wall or ceiling, the *damper* shall be permitted to be controlled by a smoke detection system installed in the *corridor*.
5. Where a ~~total-coverage~~ smoke ~~detector~~ detection system is installed in ~~provided within~~ areas served by the duct in which the damper would be located, ~~a heating, ventilation and air-conditioning (HVAC) system,~~ the *smoke dampers* shall be permitted to be controlled by the smoke detection system.

Reason: This section has remained the same for a number of cycles and is outdated.

There are several things of concern related to this section. Firstly, in methods 2 and 3 above, spot-type detectors “listed for releasing service” are referenced. While a limited number of manufacturers produce these types of detectors, most do not and it should not be a requirement that the detectors used be listed for release service. This can be confirmed by research to the UL Fire Protection Equipment Directory, Category UROX. The interface to close dampers is most often achieved by using a relay module, not a relay on the detector or detector base.

Secondly, method 1 is an example of a detector being located “within” a duct. In most cases, detectors are located outside the duct with sampling tubes protruding into the duct. While the restrictions of this method are often applied to duct detectors with sampling tubes, it suggests that only detectors placed within the duct may be used.

Lastly method 5, in our opinion, has two faults. One, the definition of “total-coverage smoke detector system” is not appropriate for the intent of the section, and two, the location for detectors should not be based on areas served by the HVAC system but rather by the areas served by the duct in which the damper is located. We were unable to locate a total-coverage smoke detector system in the IBC. And the definition in NFPA 72 is located in Chapter 17. NFPA 72 requires detectors above ceilings in some cases.
My firm has also been called on a case where a duct detector at a shaft was being replaced with detection in all areas served by the duct on one floor as part of a renovation. The smoke dampers on the floors above had duct detectors with sampling tubes. The AHJ stated that the HVAC system also serves the floors above and without full coverage on those levels they could not approve the design approach.

Also, of the 5 methods listed, method 5 is the only one that uses the plural of smoke dampers. All others apply to single dampers.

Cost Impact: There should be no cost impact as this is the standard method of installation.

FS108-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.3.3.2-FS-GODWIN

FS109 – 12

717.5.2 (IMC 607.5.2), Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

717.5.2 (IMC 607.5.2) Fire barriers. Ducts and air transfer openings of *fire barriers* shall be protected with *approved fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for stairways, ramps and exit passageways except as permitted by Sections 1022.4 and 1023.6, respectively.

Exception: *Fire dampers* are not required at penetrations of *fire barriers* where any of the following apply:

1. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance rated assembly.
2. Ducts are used as part of an *approved* smoke control system in accordance with Section 909 and where the use of a *fire damper* would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required *fire-resistance rating* of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.
4. HVAC ducts comply with the requirements of ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Add new standard to Chapter 35 as follows:

ASTM
E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal permits an additional exception to the requirement to install fire dampers in duct and air transfer openings through fire barriers provided the HVAC ducts are protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose.

This ASTM is now referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This proposal is consistent with AC 179 criterion providing an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard evaluates the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment when subjected to the standard time-temperature curve of ASTM E119.

The test method evaluates the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by a fire resistance rated construction when the HVAC duct system is exposed to fire under one or more of the following conditions:

Condition A— Fire exposure from the outside of the horizontal HVAC duct system without openings,
Condition B— Fire exposure from the outside of the vertical HVAC duct system without openings,
Condition C— Fire exposure from the outside with hot gases entering the inside of the horizontal HVAC duct system with unprotected openings, and
Condition D— Fire exposure from the outside with hot gases entering the inside of the vertical HVAC duct system with unprotected openings.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: FS 102, Part II and FS 109 provide similar provisions for ducts penetrating fire barriers. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS109-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.5.2-FS-CRIMI

FS110 – 12
717.5.3 (IMC 607.5.5)

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

717.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
   1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
   1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
   1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
   2.1 Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.0187-inch (0.4712 mm) (No. 26 gage);
   2.2. The subducts extend at least 22 inches (559 mm) vertically; and
   2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
   2.4 Kitchen systems, clothes dryer systems, and bathroom and toilet room systems are permitted to share the same shaft but not the same duct. Where multiple ducts are in the same shaft, each system shall have its own fan providing continuous upward flow, as required by Sections 504 and 505 of the International Mechanical Code.
   2.5 Dryer ducts shall have a cleanout located near the shaft penetration to permit cleaning of the 22" subduct. The subduct shall be considered in the calculation of allowable duct length reduction.
   2.6 Kitchen ducts shall be provided with an approved method for preventing grease buildup and cleaning of the duct.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the International Mechanical Code.

Reason: Since exception 2 has been installed in the IBC, it has been incomplete. The IMC has done a good job of updating the provisions for common ducts with clothes dryers but nothing has been done for domestic kitchens.

Designers would not go to the expense of installing a shaft for domestic kitchen exhaust if there was not a smoke issue. When expensive condo's install super domestic kitchens, there is going to be smoke.

Also, IMC Section 505.1 specifically requires systems with downdraft exhaust to discharge to the exterior. How is that going to be done in a multi-story building?

And, where there is smoke, there is grease. Thus, provisions are needed for kitchen exhaust and such exhaust needs to be separate from bathroom/toilet exhaust.

The designer should take some responsibility for controlling grease discharge, but specifics are left to his/her discretion.

Long dryer ducts have to install a 90 degree riser at the very end of their discharge, the weakest point. A cleanout is appropriate.

Perhaps someone has a better idea, but this should be a start.

Cost Impact: This code proposal will not increase the cost of construction since this is the method it should be designed to and it is less expensive than installation of a Type I hood.

Analysis: FS 110 proposes revisions for kitchen and dryer exhaust ducts in Groups B and R. FS 112 proposes to delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS110-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.5.3-FS-GODWIN

FS111 – 12
717.5.3 (IMC 607.5.5)

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

717.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
   - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
   - 1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
   - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
   - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
   - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187-inch (0.4712 mm) (No. 26 gage);
   - 2.2. The subducts extend at least 22 inches (559 mm) vertically; and
   - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. ~~Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the International Mechanical Code~~

Reason: This text has nothing to do with shafts and is improperly located. This information is covered completely in the IMC.

Cost Impact: None

FS111-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.5.3-FS-MCMANN

FS112 – 12
717.5.3 (IMC 607.5.5)

Proponent: Ray Grill, P.E., Arup, representing self (Ray.Grill@arupgp.com)

Revise as follows:

717.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *approved* fire and smoke *dampers* installed in accordance with their listing.

Exceptions:

~~1. *Fire dampers* are not required at penetrations of shafts where:~~
~~1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or~~
~~1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or~~
~~1.3. Ducts are used as part of an *approved* smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system; or~~
~~1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.~~
~~2. In Group B and R occupancies equipped throughoutwith an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts where:~~
~~2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.0187-inch (0.4712 mm) (No. 26 gage);~~
~~2.2. The subducts extend at least 22 inches (559 mm) vertically; and~~
~~2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.~~
~~3. *Smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.~~
~~4. *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.~~

1. Fire and smoke dampers are not required where steel exhaust subducts extend at least 22 inches (559 mm) vertically in exhaust shafts provided there is a continuous airflow upward to the outside.
2. Fire dampers are not required where penetrations are tested in accordance with ASTM E 119 as part of the fire-resistance rated assembly.
3. Fire and smoke dampers are not required where ducts are used as part of an approved smoke-control system in accordance with Section 909.
4. Fire and smoke dampers are not required where the penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than two-hour fire-resistance-rated construction.
5. Smoke dampers are not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

~~5~~6. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the *International Mechanical Code*.

Reason: This revision is consistent with amendments that have been in place in Virginia and the District of Columbia since the first adoption of the IBC.

There was never a technical basis for requiring smoke dampers at all shaft penetrations when it was first adopted during the comment period of the initial 2000 IBC development.

This requirement did not exist in any of the model building codes (BOCA, UBC & SBC) or in NFPA 101 (Life Safety Code). There have been proposals to add smoke dampers to all shaft penetrations in the NFPA codes for the last three cycles of code development and they have been rejected by the membership every time.

The justification for smoke dampers in the original code change is that smoke can travel through a duct to locations in a building that are remote from the fire. While this statement is correct, smoke travel through ducted ventilation shafts has not been a contributing factor to fire deaths in buildings. Smoke detectors at HVAC equipment have been a requirement to accomplish automatic shut off to minimize the potential of smoke spread through ventilation ducts. For example, the majority of fire deaths in upper stories of the MGM grand fire of 1980 were due to smoke spread through stair shafts and seismic joints that were not protected. Fancoil units in guestrooms drew air from the corridors which also contributed to fatalities. While the HVAC system was cited as a potential source of smoke spread, smoke detectors were not present to provide automatic shutoff of equipment (NFPA Preliminary Report of the MGM Grand Hotel Fire). There was only one fatality in an upper story of the San Juan DuPont fire in 1986 which was not readily explained. Smoke travel through ventilation shafts was not a contributing factor in the First Interstate fire in Los Angeles or the Meridian fire in Philadelphia.

Even in the World Trade Center bombing of 1993, 6 fatalities were attributed to the explosion, but there were no fatalities due to the effects of smoke (Isner, Michael S. and Klem, Thomas J., "World Trade Center Explosion and Fire," National Fire Protection Association).

While these fires were thoroughly investigated, and code changes promulgated to address fire safety issues, smoke dampers in duct penetrations of shafts were never adopted as changes to any of the model codes as a result of these fires.

There have been modifications to this section every cycle to correct the challenges with the application of the requirement. Exceptions for B and R don't make sense form a hazard or potential fire spread perspective.

Performance of Fully Sprinklered Buildings

It is important to note that the IBC requires sprinkler protection for most buildings of any significant size or occupant load (see section 903). Therefore, the performance of sprinklered buildings is relevant. There has never been a multiple life loss fire in a fully sprinkler building of any occupancy type where the occupants have not been intimate with the fire or where an explosive or terrorist event has occurred.

The original submitter of the code change in adding the additional smoke dampers does not question the reliability of sprinklers, he questions whether a 98% success factor is adequate to justify not having smoke dampers at duct penetrations and shafts. There were no fire incidents identified as part of the code change to demonstrate the need. The need for smoke dampers at ventilation shafts as a general requirement had never before been considered to be necessary to provide a reasonable level of life safety even in unsprinklered buildings.

Implications of the Requirement

The requirement for installation of smoke dampers drives additional features and requirements. These include a smoke detector in the duct to activate the damper which would be required to be supervised and connected to a fire alarm panel. HVAC controls and logic would be required to cause the appropriate damper operation upon smoke detector initiation. Ongoing maintenance and testing of the above devices is required on a regular frequency to assure operability.

Implementation of these requirements is not feasible in many instances. Smoke detectors in exhaust ducts from showers, dryers, kitchens, and other locations that produce aerosols or other materials that could trigger smoke detectors, are subject to unwanted alarms. Unwanted alarms on systems that are monitored off-site result in the fire department responding unnecessarily. This presents an added risk to firefighters.

A rough installed cost estimate for the smoke dampers and associated required equipment ranges from $1500-$3000 per damper or even more for large dampers. This does not include the ongoing cost of testing the dampers and detectors.

Cost Impact: Approval of this change will reduce the cost of construction in fully sprinklered buildings anywhere from $1500-$3000 for each smoke damper that would have been installed. This estimate includes the smoke dampers and associated required equipment. This does not include the ongoing cost of testing the dampers and detectors.

Analysis: FS 110 proposes revisions for kitchen and dryer exhaust ducts in Groups B and R. FS 112 proposes to delete these provisions. The committee needs to make its intent clear with respect to these provisions.

FS112-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.5.3-FS-GRILL

FS113 – 12
717.5.5 (IMC 607.5.4)

Proponent: Barry Gupton, PE, NC Department of Insurance, Office of State Fire Marshal, Engineering Division (barry.gupton@ncdoi.gov)

Revise as follows:

717.5.5 (IMC 607.5.4) Smoke Barriers. A listed smoke damper designed to resist the passage of smoke <u>and a listed fire damper, or a listed combination fire/smoke damper,</u> shall be provided at each point a duct or air transfer opening penetrates a smoke barrier. Smoke dampers and smoke damper actuation methods shall comply with Section 717.3.3.2

Exception<u>s</u>:

<u>1.</u> Smoke dampers are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.

<u>2.</u> <u>Fire dampers are not required where the code does not require fire dampers for duct penetrations of fire barriers or fire-resistant-rated horizontal assemblies.</u>

Reason: The current wording of the section does not address the required fire-rating portion of the barrier. Clearly indicates the use of combination fire/smoke dampers. Coordinates the section with the requirements of the IMC.

Cost Impact: The code change proposal will not increase the cost of construction.

FS113-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.5.5-FS-GUPTON

FS114 – 12
717.5.5 (IMC 607.5.4)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

717.5.5 (IMC 607.5.4) Smoke barriers. A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *smoke barrier*. *Smoke dampers* and *smoke damper* actuation methods shall comply with Section 717.3.3.2.

Exceptions:

1. *Smoke dampers* are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.
2. Smoke dampers are not required in ambulatory care facilities and Group I-2 hospital occupancies where the HVAC system is fully ducted in accordance with Section 603 of the *International Mechanical Code* and where buildings are equipped throughout with an automatic sprinkler system in accordance with Sections 903.3.1.1 and equipped with quick response sprinklers in accordance with Section 903.3.2.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

Duct smoke dampers at smoke barrier walls in facilities fully protected with electronically supervised, tested and maintained quick response automatic sprinkler systems should be omitted from the I-codes, have not been required by other model codes and have shown a history of success without the additional dampers. In preparation for this proposal the AHC asked Rolf Jensen & Associates (RJA) to review and provide comments on the “Smoke Damper Evaluation for Air Movement & Control Association International, Inc.” analysis and dated May 14, 2010. A copy of their summary can be found at www.iccsafe.org.

The supporting information, summarized by RJA for the AHC, describes information gathered in the years since quick response sprinklers (QRS) have been deployed. Untenable conditions are typically measured in amount of heat, obscuration of exit signs, and carbon monoxide levels. The studies summarized these conditions taking approximately 2 hours to 2-1/2 hours to reach untenable levels. Considering non-smoking policies in hospitals, use of Class A materials, and overall reduction of items to fuel a fire, it is highly unlikely to reach the constant burning levels noted in the study. However, even if judged in those timeframes noted in the report, the actual responder timeframe should enter into the equation. The following summarizes emergency responder timeframes:

Alarm is sounded, either by manual pull by the staff or by the automatic smoke detection system (most likely an addressable system)

- Staff employs defend-in-place method, which includes shutting doors to the origin of the fire and relocating patients out of the immediate area (i.e. to the other side of the compartment smoke barrier)
- Within 10 minutes of alarm, the fire department arrives
- In the context of the fire response, doors are opened by the fire department to find the source of the fire. These are the doors that automatically closed upon initiation of the alarm. Any mechanical system is now out of the equation, because of the active use of the doorways in the fire response, or if needed, the patient movement away from the room of origin.

In conclusion, the meaningful time of the fire protection of the building occurs in the first 30 minutes of the fire incident, when decisions are made by fire professionals and the safety staff of the hospital in terms of status of the patients. Quick response sprinklers are more often noted as the most important feature of the overall building fire protection system, and are demonstrated to be effective in containing spread of the fire than dampering of the duct system.

Please note that this proposal deals only with smoke zone barrier walls. It is not proposed to change the requirement for these dampers at shafts or at the air handler units.

The RJA comments are as follows:

Evaluations of recent automatic sprinkler performance data and smoke movement analysis report for smoke dampers revealed the following:

1. In 3,750 fires reported over the years of 2003 – 2006 in hospitals, mental health and substance abuse facilities; one civilian death was recorded. That individual was within the room of fire origin within a mental health facility and started the fire.
2. The overwhelming majority (i.e. 97+%) of fires within these facilities did not extend beyond the room of origin, despite having an automatic suppression system present in only 57% of reported fires.
3. Automatic sprinkler protection in a hospital has higher reliability and better performance than other occupancies. In over 1,600 fires in hospitals spanning 2003 - 2006, when sprinklers were present and the fires were large enough to activate an automatic suppression system, those systems showed a 97% operational reliability and were effective 100% of the time.
4. The requirements for electronically supervised hydraulically designed automatic sprinkler system increases the system reliability
5. Properly documented testing and maintenance improves the reliability of these systems. CMS holds healthcare facility operators accountable for the testing and maintenance requirements of NFPA 25. Verification of this documentation and maintenance records are checked every 1 to 3 years.
6. Tenable conditions are present in the smoke movement analysis for sprinklered buildings with or without smoke dampers.
7. Tenable conditions in non sprinklered configurations can be maintained for test fire duration of 30 minutes beyond room of origin.

Due the required automatic system design requirements, the limited smoke movement in a fully sprinklered building, required testing and maintenance of these suppression systems, the omission of smoke dampers is justified. There are still multiple safeguards to protect the building occupants from a multiple loss of life fire.

The use of smoke dampers between smoke zones in hospitals protected with Quick Response automatic Sprinklers (QRS) is being evaluated based on the reports of fire outcomes in hospitals; automatic sprinkler system reliability, performance, and effectiveness; and an assessment of previous smoke movement work in non sprinklered configurations.

NFPA issued an updated report on automatic sprinkler performance in two different reports [1][2]. The reported data has been reviewed and evaluated for hospital facilities when possible. The failure modes will be reviewed and addressed based on current Building Code and Fire Code requirements.

Jennifer Flynn's report [2] shows there were 3,750 fires reported to have occurred over the years of 2003 – 2006 in hospitals, mental health, substance abuse and medical office type facilities. In all those fires, one fatality was reported, and that fatality occurred within the room of fire origin. That one fatality occurred as a result of a mental health patient using flammable liquids and igniting the mattress and other materials within his room.

Of reported 2003-2007 structure fires in health care properties, an estimated 57% showed sprinklers present, with higher percentages for hospitals (71%) and nursing homes (65%) and a much lower percentage for clinics and doctor's offices (28%). Sprinklers were also reported as present in half or more of all reported fires in laboratories (60%), manufacturing facilities (52%), theaters (50%), and prisons and jails (50%). In every other property use, more than half of all reported fires had no sprinklers.

Hospitals have the highest percentage of automatic sprinklers present in all the occupancies analyzed in this report. Despite suppression systems being present in only
57% of health care properties where fires were reported, those fires only extended beyond the room of origin in less than 3 percent of all reported fires. This can be directly attributed to the **R.A.C.E.** training medical staff are mandated to receive annually. The **C** in RACE relates to *confining* the fire. More simply, medical staff are trained to close the doors in rooms where fires ignite, after they **R**escue patients near the fire origin and **A**lert others of the presence of the fire.

For most property use groups and most types of automatic extinguishing equipment, the majority of reported fires were too small to activate operational equipment.
When automatic extinguishing equipment was present, the percentages of fires too
small to activate operating equipment, based on overall reported structure fires, were as follows:

- 65% for all sprinklers,
- 65% for wet pipe sprinklers,
- 70% for dry pipe sprinklers,
- 61% for dry (or possibly wet) chemical systems,
- 43% for carbon dioxide systems,
- 66% for foam systems, and
- 59% for halogen systems.

Sprinklers in the area of fire failed to operate in only 7% of reported structure fires large enough to activate sprinklers. Based on Table A [1] , non confined fires larger than the sprinkler design area happened less than 2.0 % of the total non-confined and confined structure fires for healthcare buildings. These fires may affect a large part of a smoke compartment but they rarely happen.

Table 3A [1] indicates the percentage of effective operation of sprinklers in 620 fires large enough for sprinkler activation at 87% in all healthcare related facilities. The Flynn report breaks this down by type of healthcare facility. Where sprinklers were present and the fire was large enough to operate the sprinklers in hospitals alone, sprinklers were effective 100 percent of the time.

The assessment of automatic sprinkler failures are summarized in Table 4A [1]. However, healthcare or hospitals are not separated as an occupancy type.
The reason sprinklers fail to operate in all occupancies are:

1.	System turned off	53%
2.	Inappropriate suppression system	20%
3.	Lack of Maintenance	15%
4.	Manual intervention	9%
5.	System component damages	2%

In new and existing hospitals, the automatic sprinkler systems require electronic supervision. This supervision will typically address the major (53%) reason for system failure. This analysis is limited to hospitals. Automatic water based suppression is the appropriate means to control fires in this healthcare occupancy. This addresses 20% of the documented failures. Automatic water based suppression systems are required for all new hospitals and all renovations over 4000 square feet. 73%of the failures are addressed by electronically supervised automatic sprinkler systems.

Lack of maintenance is addressed by the CMS enforcement which ensures facilities follow NFPA 25. Existing healthcare facilities are required to document the NFPA 25 inspection, testing and maintenance on all water based suppression systems. Through contracts with state public health and fire marshal's offices that direct periodic surveys, CMS ensures that the needed inspection, testing and maintenance is provided in health care facilities. This work will also identify damaged system components. The required testing and maintenance and damage will address 17% of the documented failures.

Manual intervention is a fire service function. Standard operating procedures recommend determining the fire no longer poses a threat before shutting the system down.

The Hall report (1) also notes reasons for ineffectiveness of systems. This category addresses the effectiveness of a system not the failure. These systems still operated but not at the design intent. These have 2 major categories. Extinguishing agent did not reach the fire and not enough extinguishing agent available.

Shielded fires are the first category. These can be addressed by proper design. Small shielded fires under tables or beds are within the design parameters of a NFPA 13 compliant sprinkler system. Missing areas under duct work or within storage racks are the typical issues in this category. These types of items, if missed in the initial design and installation, should be identified in the ongoing testing and maintenance required by NFPA 25.

Insufficient extinguishing agent addresses inadequate water supply and partially closed valves. Proper maintenance and testing will identify a deteriorating water supply. The electronic supervision required for the hospital sprinkler system will send a trouble alarm to the fire alarm panel for partially closed control valves.

The hydraulically designed, electronically supervised, and regularly tested and maintained automatic sprinkler system is substantially more reliable than the current performance data indicate. Fire loss data also shows there has not been a documented multiple loss of live fire due to fire in a fully sprinklered building.

This sprinkler system analysis was done to evaluate the current data and how it relates to hospitals and demonstrates that the probability of a catastrophic failure of the required sprinkler system is remote. The biggest influence on the automatic sprinkler performance is the fire services for a properly designed, installed and maintained sprinkler system.

SMOKE DAMPER EVALUATION – ADDITIONAL CONSIDERATIONS

This portion of the reason statement evaluates an analysis prepared by Koffel Associates, Inc. (KA) titled "Smoke Damper Evaluation for Air Movement & Control Association International, Inc." and dated May 14, 2010. The purpose of our evaluation is to closely examine the details, assumptions, and conclusions related to the KA analysis to quantify the severity of hazardous conditions expected given the smoke spread predicted in the analysis for the scenarios with and without smoke dampers.

The KA analysis utilized a CONTAM computer model to predict smoke movement throughout a representative building under various conditions. The primary variables considered in this comparative analysis were whether the fire was sprinklered or unsprinklered and whether smoke dampers were included or omitted from the model. Data from a study titled "Fire Experiments of Zoned Smoke Control at the Plaza Hotel in Washington DC" by John H. Klote at the National Institute of Standards and Technology (NIST), 1990, was used as a basis for modeling smoke in the CONTAM model. Specifically, the KA analysis assumed a smoke concentration of 5.66×10^{-5} lb/ft^3 in the compartment of origin for the unsprinklered fire scenario and a concentration of 1.89×10^{-6} lb/ft^3 for the sprinklered fire scenario which is reportedly based on the fire test data contained in the Klote study.

The Klote study involved real fire tests conducted in the Plaza Hotel, a seven-story masonry structure. The Plaza Hotel tests were intended to evaluate the effectiveness of zoned mechanical smoke control systems. While not specified in the KA analysis, it appears that data from Plaza Hotel Test 1 and/or Test 5 was used for the unsprinklered fire scenario and data from Test 10 was used for the sprinklered fire scenario. Each of these three fire tests involved burning a 300 lb wood crib in a second floor corridor of the Plaza hotel with no mechanical smoke control systems active and all windows closed. Table 1 and Table 2 below summarize the select relevant data presented in the Klote study and KA analysis. This data shows movement away from the area of fire origin with and without smoke dampers installed in the model.

Table 1: Klote Study Results

	Tests 1 and 5	Test 10
Fuel Load	300 lb Wood Crib	300 lb Wood Crib
Test Duration	30 min	30 min
Sprinkler Interaction	No Sprinklers	Quick Response Sprinkler above Wood Crib
Peak Optical Density on Fire Floor (Fig. 24, 25)	3 m^{-1} @ 4 mins[1]	0.1 m^{-1} @ 3 mins
Peak CO Concentration on Fire Floor (Fig. 21)	~6,000 ppm	~200 ppm

The maximum optical density from Tests 1 and 5 was not reported in the Klote study. This optical density value is estimated based on the CO concentrations, which show a factor of 30 differential between the sprinklered and unsprinklered fire scenarios. This factor of 30 was applied to the maximum optical density value that was reported in the sprinklered fire test (Test 10). This assumption matches the KA analysis which assumed a smoke concentration for the unsprinklered fire scenario that was approximately 30 times the sprinklered scenario.

Table 2: KA Analysis Results
Smoke Concentration on Non-Fire Floor
(presented as % of smoke concentration on Fire Floor)

	Smoke Dampers	Without Smoke Dampers
5 Story Building @ 30 mins	1.37%	25.05%
5 Story Building @ 1 hour	2.51%	40.33%
5 Story Building @ 12 hours	7.78%	64.28%
50 Story Building @ 30 mins	0.11%	2.88%
50 Story Building @ 1 hour	0.21%	5.21%
50 Story Building @ 12 hours	0.69%	15.15%

The most severe conditions on the non-fire floor predicted by the KA analysis consider a 5 story building, no smoke dampers, and a constant smoke concentration on the fire floor over a 12-hour period. This scenario predicted that after 12 hours, the conditions on the non-fire floor, in terms of smoke concentrations, would be 64.28% of the conditions on the fire floor. After 30 minutes of constant conditions on the fire floor, the non-fire floor smoke concentration is 25.05% of that on the fire floor.

It should be noted that the assumption of constant peak smoke conditions for an extended period of time (as much as 12 hours) on the fire floor is extremely conservative. The Klote study data is based on a 30 minute test duration where the peak smoke concentrations (obscuration and CO concentrations) occur at one particular instance during the 30 minute test. Further, a fire burning at a constant rate over a 12 hour period of time would necessitate a fuel load to support such a fire. The most densely packed storage occupancies have fuel loads approaching only 3 or 4 hours.

The KA assumption is particularly conservative when considering the sprinkler controlled fire where Klote's study indicates that the fire in Test 10 was extinguished about 7 minutes after fire ignition. Klote's study also indicates that for the unsprinklered fires (Tests 1 and 5) the heat release rate of the fire decreased due to low oxygen levels after approximately 15 minutes as can be seen by the reduction in temperature shown in Figure 12 of the Klote study. So, maintaining a constant fire burning rate over a 30- minute duration is unlikely and is a very conservative assumption, especially in a building like hospitals that is occupied 24/7 by alert staff.

The following tables are intended to assess the degree of tenable conditions that may be present on the non-fire floor (for cases with and without smoke dampers) considering the referenced data from the Klote's study and the smoke concentration modeling performed in the KA analysis. The data in Table 3 is based on the CONTAM model results for the 5 story building only, which was the most challenging building configuration in terms of smoke concentrations on the non-fire floor.

Table 3: Tenability Analysis- Sprinklered Fire Scenario

Klote Test 10 (Sprinklered Fire)		
Peak Optical Density (D) on Fire Floor (Fig. 24, 25)	$0.1\ m^{-1}$ @ 3 mins	
Peak CO Concentration on Fire Floor (Fig. 21)	~200 ppm	
Calculated Visibility Based on Optical Density[1]	34.8 m (lighted sign)	
	With Smoke Dampers	**Without Smoke Dampers**
Predicted CO Concentration on Non-Fire Floor at 30 mins	200 ppm * 1.37% **= 3 ppm**	200 ppm * 25.05% **=50 ppm**
Predicted Visibility on Non-Fire Floor at 30 mins	34.8 m / 1.37% **= 2538 m**	34.8 m / 25.05% **= 138 m**
Predicted CO Concentration on Non-Fire Floor at 1 hour	200 ppm * 2.51% = **5 ppm**	200 ppm * 40.33% **=81 ppm**
Predicted Visibility on Non-Fire Floor at 1 hour	34.8 m / 2.51% **=1385 m**	34.8 m / 40.33% **= 86 m**
Predicted CO Concentration on Non-Fire Floor at 12 hours	200 ppm * 7.78% **=16 ppm**	200 ppm * 64.28% **=129 ppm**
Predicted Visibility on Non-Fire Floor at 12 hours	34.8 m / 7.78% **=447 m**	34.8 m / 64.28% **=54 m**

[1] The optical densities (D) reported in the Klote Study were converted to light extinction coefficients (K) by K=2.3D and visibilities (V) were calculated to light-emitting (exit) sign by V-8/K.

Table 4: Tenability Analysis- Unsprinklered Fire Scenario

Klote Tests 1 and 5 Data (Unsprinklered Fire)		
Peak Optical Density (D) on Fire Floor (Fig. 24, 25)	$3\ m^{-1}$ @ 4 min	
Peak CO Concentration on Fire Floor (Fig. 21)	~6,000 ppm	
Calculated Visibility Based on Optical Density [1]	1.2 m (lighted sign)	
	With Smoke Dampers	**Without Smoke Dampers**
Predicted CO Concentration on Non-Fire Floor at 30 mins	6,000 ppm * 1.37% **=83 ppm**	6,000 ppm * 25.05% **=1503 ppm**
Predicted Visibility on Non-Fire Floor at 30 mins	1.2 m / 1.37% **= 84.7 m**	1.2 m / 25.05% **= 4.6 m**
Predicted CO Concentration on Non-Fire Floor at 1 hour	6,000 ppm * 2.51% **=151 ppm**	6,000 ppm * 40.33% **=2420 ppm**
Predicted Visibility on Non-Fire Floor at 1 hour	1.2 m / 2.51% **=46.2 m**	1.2 m / 40.33% **= 2.9 m**
Predicted CO Concentration on Non-Fire Floor at 12 hour	6,000 ppm * 7.78% **=467 ppm**	6,000 ppm * 64.28% **=3857 ppm**
Predicted Visibility on Non-Fire Floor at 12 hour	1.2 m / 7.78% **=14.9 m**	1.2 m / 64.28% **=1.8 m**

[1]The optical densities (D) reported in the Klote Study were converted to light extinction coefficients (K) by K=2.3D and visibilities (V) were calculated to light-emitting (exit) sign by V=8/K.

The KA analysis discusses tenability on the non-fire floor in terms of visibility through smoke. A tenability performance criterion of approximately 10 meters (30 feet) is cited by the KA analysis as a commonly used value. While this visibility criterion is within ranges of visibility criteria for general building applications presented by The SFPE Handbook, 4th edition (Section 2, Chapter 4) Table 2-4.3, a lower criterion of 4 meters is suggested for healthcare occupancies where patients and staff are familiar with their surroundings and egress paths are typically defined by small rooms and corridors as opposed to large open spaces where greater visibility is necessary. Table 2-4.2 of the SFPE Handbook suggest a visibility threshold of 4 meters to allow safe escape when occupants are familiar with their surroundings.

Although not referenced in the KA analysis, tenability is also often measured in terms of carbon monoxide (CO) concentrations. CO is a measure of the toxicity of smoke that occupants are exposed to during evacuation. Carbon monoxide (CO) causes the formation of carboxyhemoglobin in the bloodstream when it is being breathed in the air during exposure. This relationship between exposure time and the concentration of carbon monoxide is dynamic, varying based upon the varying concentrations of CO within the surroundings and the physical condition of the individual. A more detailed discussion of the formation of carboxyhemoglobin can be found in the SFPE Handbook, 4th edition (Section 2, Chapter 6). Figure 2-6.14 of the SFPE Handbook indicates that occupant exposure with an at rest respiratory rate to a carbon monoxide concentration of 2,000 parts per million (ppm) can be experienced for 30 minutes before incapacitation occurs. Based on this relationship between exposure time and concentration, a conservative tenability criterion for carbon monoxide concentrations of 2000 ppm is suggested.

Based on the tenability criteria of 4 meters for visibility and 2000 ppm for CO concentrations, the data in the Klote study for the sprinklered fire indicates that conditions were tenable on the fire floor during the 30 minute fire test as the minimum visibility was measured to be 34.8 meters to a lighted exit sign and a maximum CO concentration of approximately 200 ppm. If the conditions on the fire floor are tenable, then any lower concentrations of smoke on non-fire floors, as predicted by the KA analysis, will also be tenable. This suggests that for sprinkler controlled fires, tenable conditions will be maintained on the non-fire floor, regardless of whether smoke dampers are installed, when considering the assumptions contained in the KA analysis. This is further supported by a study performed by Notarianni, "Measurement of Room Conditions and Response of Sprinklers and Smoke Detectors During a Simulated Two- Bed Hospital Patient Room Fire", NISTIR 5240, 1993 which assessed performance of sprinklers and smoke detectors in typical hospital room configurations. This study concluded that in all tests, with one exception, the sprinklers actuated in the room of fire origin before the patient's life would be threatened. The one exception was the shielded fire test where the sprinklers activated after untenable conditions were reached in the patient room. This study supports the assertion that in most cases sprinklers will activate and control further growth of the fire before untenable conditions are reached in the room of origin. Therefore, the sprinklers help to control the spread of untenable conditions throughout the building.

The results of for the unsprinklered fire scenario in Table 4 above show a minimum visibility on the non-fire floor of 4.6 meters to a lighted exit sign and a maximum CO concentration of 1503 ppm after 30 minutes of constant peak conditions on the fire floor. Based on the tenability criteria cited above of at least 4 meters of visibility and a maximum CO concentration of 2000 ppm, the conditions after 30 minutes for the unsprinklered fire scenario can also be considered tenable. It should be noted that the lowest visibility conditions in the Klote study occurred no earlier than 4 minutes after fire ignition and the maximum CO concentrations occurred no earlier than 15 minutes after fire ignition. The KA analysis for the 30 minute exposure assumes these most severe conditions on the fire floor from fire ignition (time zero) which indicates that tenable conditions should be maintained on the non-fire floor for more than 30 minutes after fire ignition when considering the delay in the Klote tests from ignition to when the most severe conditions occur in on the fire floor.

For the 1991 edition of NFPA 101, the Subcommittee on Health Care Occupancies performed studies that evaluated the benefits of healthcare occupancies when provided with a fully automatic sprinkler system and quick response sprinkler heads. All new Group I-2 buildings are required to be provided with a fully automatic sprinkler system and QRS. The studies discussed and mentioned above provide further scientific documentation that sprinklers are a more than effective means of mitigating the transfer of smoke beyond smoke compartment walls, as was discussed over twenty years ago.

Additionally, the requirements for interior finishes, decorative materials, mattresses, upholstered furniture, decorative vegetation and other decorative furnishings have become more restrictive in the past twenty years as well. Test standards have been developed to further quantify statistical information regarding the flame spread and smoke development of each of these above items. With these added restrictions within Group I-2 occupancies, the flame spread and smoke development ratings of these have assisted in the reduction of a greater potential event.

This review and analysis of previous fire tests, studies, and performance data provides a basis for justification to omit smoke dampers in new I-2 healthcare facilities. The performance of a building without automatic sprinkler protection has many variables to consider. The analysis above does look at typical non sprinklered scenarios and shows acceptable performance for at least the first 30 minutes. Emergency responders will be on site to assist the staff in a fire response. The recent fire records in healthcare facilities both sprinklered and non sprinklered show an ability to protect the person not intimate with a fire.

Bibliography

(1) *U.S. Experience with Sprinklers and Other Automatic Fire Extinguishing Equipment*, John R. Hall, Jr. P.E. PhD, National Fire Protection Association, 2010

(2) *Structure Fires in Medical, Mental Health, and Substance Abuse Facilities*; Jennifer D. Flynn; National Fire Protection Association; February 2009

Cost Impact: The code change proposal will reduce the cost of construction and will eliminate on-going maintenance costs.

FS114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.5.5-FS-Williams-AdHocHealthcare

FS115 – 12
717.6.2.1 (IMC 607.6.2.1)

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

717.6.2.1 (IMC 607.6.2.1) Ceiling radiation dampers. *Ceiling radiation dampers* shall be tested in accordance with Section 717.3.1. *Ceiling radiation dampers* shall be installed in accordance with the details *listed* in the fire-resistancerated assembly and the manufacturer's installation instructions and the listing. *Ceiling radiation dampers* are not required where ~~either~~ one of the following applies:

1. Tests in accordance with ASTM E 119 or UL 263 have shown that *ceiling radiation dampers* are not necessary in order to maintain the *fire-resistance rating* of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 714.4.1.2, are located within the cavity of a wall and do not pass through another *dwelling unit* or tenant space.
3. Where duct and air transfer openings are protected with a duct outlet protection system tested as part of a fire-resistance-rated assembly in accordance with ASTM E 119 or UL 263.

Reason: This proposal is intended to permit the use of duct protection methods other than ceiling radiation dampers for protecting ducts and air transfer openings through the ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly. The acceptance of the alternate duct protection systems is based on testing conducted in accordance with ASTM E 119 or UL 263. Although one could arguable use the current Provision No. 1 of Section 717.6.2.1 to rationalize the use of alternate duct protection methods, this proposal makes it clear that alternate methods are permitted based on testing. Example of alternate protection methods include insulation and wrap materials.

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Cost Impact: None

FS115-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.6.2.1-FS-EUGENE

FS116 – 12
717.6.3 (IMC 607.6.3)

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

717.6.3 (IMC 607.6.3) Nonfire-resistance-rated floor assemblies. Duct systems constructed of *approved* materials in accordance with the *International Mechanical Code* that penetrate nonfire-resistance-rated floor assemblies shall be protected by any of the following methods:

1. A shaft enclosure in accordance with Section 713.
2. The duct connects not more than two *stories*, and the *annular space* around the penetrating duct is protected with an *approved* noncombustible material that resists the free passage of flame and the products of combustion.
3. ~~The duct connects not more than three *stories*, and the *annular space* around the penetrating duct is protected with an *approved* noncombustible material that resists the free passage of flame and the products of combustion and a *fire damper* is installed at each floor line.~~

   ~~**Exception:** *Fire dampers* are not required in ducts within individual residential *dwelling units*.~~

Reason: This text is in conflict with where fire-dampers are to be installed. Fire dampers are not tested or listed to be installed in this application. This is an apparent cost saving measure in an attempt to circumvent the requirements for shafting by installing fire-dampers in wood floors. The code has stood on the cherished principle that materials and products be installed in accordance with the manufacturer's instructions and the listings but in this case there are no instructions or listings to install the product. Code enforcement is placed in an awkward position to permit installations that violate listings. There needs to be other language installed in the code that achieves the desired outcome without resorting to violating listings. This is an inappropriate use of a product and it's difficult to defend the practice. A companion change has been submitted to the IMC committee

Cost Impact: None

FS116-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.6.3-FS-MCMANN

FS117 – 12
716.7 (IMC 607.7), 716.7.1 (IMC 607.7.1 (New))

Proponent: Umesh Kumar Bhargava, PE., Bhargava International, Inc., representing self

Add new text as follows:

717.7 (IMC 607.7) Flexible ducts and air connectors. Flexible ducts and air connectors shall not pass through any fire-resistance-rated assembly. Flexible air connectors shall not pass through any wall, floor or ceiling.

<u>**717.7.1 (IMC 607.7.1) Length of metallic duct.** The minimum length and minimum thickness of metallic duct on either side of the any wall, floor or ceiling shall be 36 inches (914 mm) and 20 gauge, respectively.</u>

Reasons: Current code does not provide guidance regarding length of the metallic duct on either side of fire rated assembly. Metallic duct will protect fire characteristic of fire rated assembly. This is similar to opening are not permitted within fire rated walls and rated demising walls.

Cost Impact: None

FS117-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.7-FS-BHARGAVA

FS118 – 12
717.8 (New) [IMC 607.8 (New)]

Proponent: Timothy Burgos, InterCode Incorporated, representing 3M Company

Add new text as follows:

717.8 (IMC 607.8) Reflective Ducts. Reflective ducts that are designed and installed to provide light to the interior space of a building shall be constructed, braced, reinforced and installed to provide structural strength and durability in accordance with the requirements of Section 608 of the *International Mechanical Code*. The installation of reflective ducts shall not affect the fire protection requirements specified in this code. Reflective ducts shall not be used for conveying air and are not required to be pressurized.

Reason: The purpose of this code change proposal is to add a new section to the International Building Code in order to differentiate between duct used to convey air and duct used to convey light. There are many new technologies that exist worldwide today that bring light from the exterior of a building to the interior space of a building. These technologies utilize a reflective duct to convey the light into the building. The reflective duct is similar in construction to duct used to convey air in the way it is braced, reinforced, and installed. Reflective duct differs because it is not used to condition a space. Additionally, reflective duct does not need to meet all the requirements of an air conveying duct, i.e. the insulation and pressurization requirements.

The language used to create the new Section 717.8 was adapted from Section 603 of the 2012 International Mechanical Code.

Reflective duct (the two ducts on the outside) in an open ceiling alongside a traditional HVAC duct.

Cost Impact: The code change proposal will not increase the cost of construction.

FS118-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

717.8 (NEW)-FS-BURGOS

FS119 – 12
718.2.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

718.2.1 Fireblocking materials. *Fireblocking* shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of *mineral wool*, *mineral fiber* or other *approved* materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as tested in accordance with ASTM E119 or UL 263, for the specific application.

Reason: This proposals clarifies the code requirement and prevents potentially unintended test methods from being used for these purposes. The proposal aims to provide more detail to the requirement to test cellulose insulation in accordance with the appropriate fire test standards. During the last cycle, FS118-09/10 added spray-applied cellulose to the list of acceptable fireblocking materials. The proponents statement does identify ASTM E119 as the test standard used by the Cellulose Insulation Manufacturers Association (CIMA) to conduct a variety of fireblocking fire tests.

Cost Impact: This proposal will not increase the cost of construction.

FS119-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

718.2.1-FS-CRIMI

FS120 – 12
720.2, 720.3, 720.4, 720.6

Proponent: Rick Thornberry, P.E. representing the Cellulose Insulation Manufacturers Association (CIMA)

Revise as follows:

720.2 Concealed insulation. Insulating materials, where concealed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

> **Exception:** ~~Cellulose~~ <u>Cellulosic fiber</u> loose-fill insulation ~~that is not spray applied,~~ complying with the requirements of Section 720.6~~,~~ shall only be required to meet the smoke-developed index of not more than 450.

720.3 Exposed insulation. Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

> **Exception:** ~~Cellulose~~ <u>Cellulosic fiber</u> loose-fill insulation ~~that is not spray applied~~ complying with the requirements of Section 720.6 shall only be required to meet the smoke-developed index of not more than 450.

720.4 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 or UL 723 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 720.2 and 720.3 when tested in accordance with CAN/ULC S102.2.

> **Exception:** ~~Cellulose~~ <u>Cellulosic fiber</u> loose-fill insulation shall not be required to be tested in accordance with CAN/ULC S102.2, provided such insulation <u>has a smoke-developed index of not more than 450 and</u> complies with the requirements of ~~Section 720.2 or 720.3, as applicable, and~~ Section 720.6.

720.6 ~~Cellulose~~ <u>Cellulosic fiber</u> loose-fill insulation<u> and self-supported spray applied cellulosic insulation</u>. ~~Cellulose~~ <u>Cellulosic fiber</u> loose-fill insulation <u>and self-supported spray applied cellulosic insulation</u> shall comply with CPSC 16 CFR Part<u>s</u> 1209 and ~~CPSC 16 CFR Part~~ 1404. Each package of such insulating material shall be clearly labeled in accordance with CPSC 16 CFR Part<u>s</u> 1209 and ~~CPSC 16 CFR Part~~ 1404.

Reason: The purpose of this code change proposal is to clarify the requirements for cellulose insulation by substituting the industry terms for the two types of cellulose insulation commonly used: cellulosic fiber loose-fill insulation and self-supported spray applied cellulosic insulation. These two terms are taken from ASTM C 739, Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation and ASTM C 1149, Standard Specification for Self-Supported Spray Applied Cellulosic Thermal Insulation, respectively. The application of the Exception to Section 720.4 is also simplified and made more user friendly by including the smoke-developed index requirement and deleting the references to Sections 720.2 and 720.3 where that requirement is specified by the Exceptions to those sections. This saves the code user a step in the process of applying Section 720.4 and avoids potential misapplications and misinterpretations that often occur when dealing with multiple Exceptions.

Cost Impact: The code change proposal will not increase the cost of construction.

FS120-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

720.2-FS-THORNBERRY

FS121 – 12
720.2, 720.3, 720.4

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

720.2 Concealed installation. Insulating materials, where concealed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

> **Exception:** Cellulose loose-fill insulation that is not spray applied, complying with the requirements of Section 720.6, shall not be required to meet a flame spread index requirement but shall ~~only~~ be required to meet a ~~the~~ smoke-developed index of not more than 450 when tested in accordance with CAN/ULC S102.2.

720.3 Exposed installation. Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

> **Exception:** Cellulose loose-fill insulation that is not spray applied, complying with the requirements of Section 720.6, shall not be required to meet a flame spread index requirement but shall ~~only~~ be required to meet a ~~the~~ smoke-developed index of not more than 450 when tested in accordance with CAN/ULC S102.2.

720.4 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 or UL 723 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 720.2 and 720.3 when tested in accordance with CAN/ULC S102.2.

> **Exception:** Cellulose loose-fill insulation shall not be required to meet a flame spread index requirement when ~~be~~ tested in accordance with CAN/ULC S102.2, provided such insulation complies with the requirements of Section 720.2 or 720.3, as applicable, and Section 720.6.

Reason: Recent discussions have shown that cellulose loose fill insulation is actually tested in the ASTM E84 test by using an artificial steel screen with tiny grid openings such that the flame spread index determined is meaningless because of the massive effect of the metal included with the loose fill insulation. Unless that screen is used the cellulose loose fill insulation falls through the grid onto the tunnel floor. The IBC (and the IRC) have long ceased to require that cellulose loose fill insulation meets a flame spread index criterion (if it complies with the CPSC requirements in 16 CFR 1209 and 16 CFR 1404, i.e. smoldering tests) but only that the insulation meets a smoke developed index. There is consensus in the fire test community that if the flame spread index cannot be determined adequately with the ASTM E84 test using that steel screen, neither can the smoke developed index be determined. Therefore, the recommendation is that the tests be conducted in accordance with CAN/ULC S102.2 and not ASTM E84, where no metal screen is needed since the loose fill insulation material is tested on the floor and not on the ceiling.

Usually cellulose loose fill insulation will meet the appropriate smoke developed index values but the appropriate fire test needs to be used.

Language in ASTM E84:

X1.6.1 Loose-fill insulation shall be placed on galvanized steel screening (Note 11) with approximate 3/64-in. (1.2-mm) openings supported on a test frame 20 in. (508 mm) wide by 2 in. (51 mm) deep, made from 2 by 3 by 3/16-in. (51 by 76 by 5-mm) steel angles (see Fig. X1.2). Three frames are required to cover the full tunnel length. The insulation shall be packed to the density specified by the manufacturer.

Note 11: The use of galvanized steel screening normally lowers the flame spread index values obtained for some materials that are tested in this manner and, therefore, the results do not necessarily relate directly to values obtained for other materials mounted without galvanized steel screening.

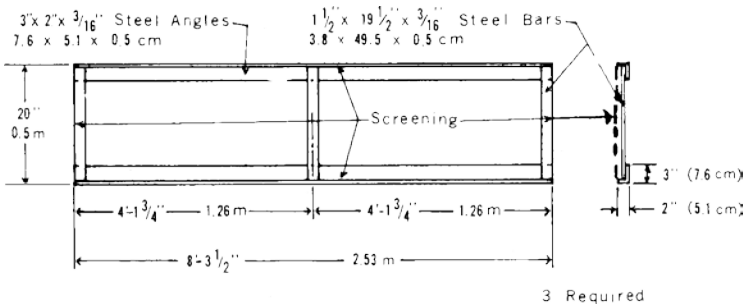


FIG. X1.2 Steel Frame for Loose Fill Materials

Cost Impact: None

FS121-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

720.2-FS-HIRSCHLER

FS122 – 12

Table 721.1(3)

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

TABLE 721.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a, q]

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
23. Wood I-joist (minimum joist depth 9-1/4" with a minimum flange depth of 1-5/16" and a minimum flange cross-sectional area of ~~2.3~~ 2.25 square inches) at 24" o.c. spacing with ~~1" by 4 inch (nominal)~~ a minimum 1x4 (3/4" x 3.5" actual) ~~wood furring strip spacer~~ ledger strip applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the ~~1"x4" furring strip spacer~~ 1x4 ledger strip.	23-1.1	½" deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1-7/8" Type S drywall screws, 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with 1-1/8" Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
27. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1-15/16" and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3/8") @ 24" o.c.	27-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by ~~1-5/8~~ 1-1/4" Type S drywall screws. Two Layers of ½" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1

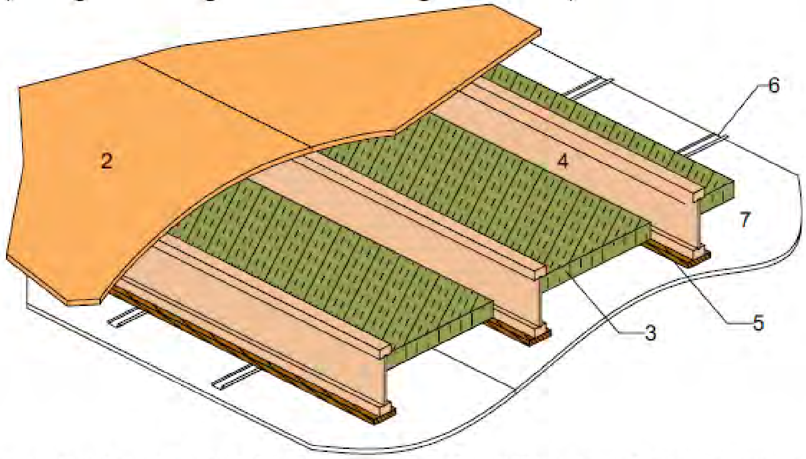
(Portions of table not shown remain unchanged)

Reason: The changes proposed here are editorial. The original publication of this entry contained typographical errors such as rounding the minimum flange cross-sectional area to 2.3 cubic inches from the original submitted text of 2.25 cubic inches. Other changes are simply to clean up language involving nominal dimension or actual dimension and other nontechnical issues. In Item 27, the minimum required length of the drywall screws was incorrectly entered as 1-5/8inch when the actual minimum is 1-1/4inch.

On the following pages, WIJ-1.3 is the information from AWC, including the test report reference, for item #23 and WIJ-1.6 is the information for item #27 in the table.

WIJ-1.3 One-Hour Fire-Resistive Ceiling Assembly

Floor[a]/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements.
3. **Insulation:** Minimum 2 inch thick mineral wool insulation batts – 3.5 pcf (nominal), supported by setting strip edges, friction-fitted between the sides of the I-joist flanges.
4. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.
   Minimum I-joist flange depth: 1-5/16 inches
   Minimum I-joist flange area: 2.25 inches^2
   Minimum I-joist web thickness: 3/8 inch
   Minimum I-joist depth: 9-1/4 inches

   See ASTM D 5055-07 for qualification requirements.
5. **Setting Strips:** Minimum 1x4 (nominal) wood setting strips attached with 1-1/2 inch long drywall screws at 24 inches on center along the bottom flange of I-joist creating a ledge to support insulation.
6. **Resilient Channels:** Minimum 0.019 inch thick galvanized steel resilient channels, attached perpendicular to I-joists using 1-7/8 inch long drywall screws. Resilient channels spaced 16 inches on center and doubled at each wallboard end joint extending to the next joist.
7. **Gypsum Wallboard:** Minimum 5/8 inch thick Type C gypsum wallboard installed with long dimension perpendicular to resilient channels and fastened to each channel with minimum 1-1/8 inch long Type S drywall screws. Fasteners spaced 7 inches on center and 3/4 inches from panel edges and ends. End joints of wallboard staggered.
7. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

Fire Test conducted at National Gypsum Testing Services, Inc. September 28, 2001
Third Party Witness: Underwriter's Laboratories, Inc. Report No: NC3369

STC and IIC Sound Ratings for Listed Assembly							
Without Gypsum Concrete				With Gypsum Concrete			
Cushioned Vinyl		Carpet & Pad		Cushioned Vinyl		Carpet & Pad	
STC	IIC	STC	IIC	STC	IIC	STC	IIC
51[b]	46[b]	52	66	60[b]	48[b]	60[b]	60[b]

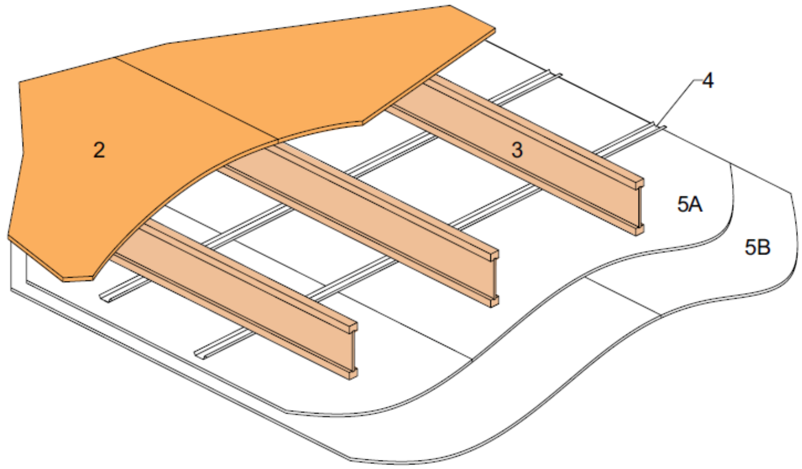
[a] This assembly may also be used in a fire-rated roof/ceiling application, but only when constructed exactly as described.

[b] STC and IIC values estimated by David L. Adams Associates, In

 January 2009

WIJ-1.6 One-Hour Fire-Resistive Ceiling Assembly

Floor[a]/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. **Floor Topping (optional, not shown):** Gypsum concrete, lightweight or normal concrete topping.
2. **Floor Sheathing:** Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements with minimum 8d common nails.
3. **Structural Members:** Wood I-joists spaced a maximum of 24 inches on center.

   Minimum I-joist flange depth: 1-5/16 inches — Minimum I-joist flange area: 2.25 inches^2

   Minimum I-joist web thickness: 3/8 inch — Minimum I-joist depth: 9-1/2 inches

   See ASTM D 5055-07 for qualification requirements.
4. **Resilient Channels[b]:** Minimum 0.019 inch thick galvanized steel resilient channel attached perpendicular to the bottom flange of the I-joists with one 1-1/4 inch drywall screw. Channels spaced a maximum of 16 inches on center [24 inches on center when I-joists are spaced a maximum of 16 inches on center].
5. **Gypsum Wallboard:** Two layers of minimum 1/2 inch Type X gypsum wallboard attached with the long dimension perpendicular to the resilient channels as follows:

   5a. Wallboard Base Layer: Base layer of wallboard attached to resilient channels using 1-1/4 inch Type S drywall screws at 12 inches on center.

   5b. Wallboard Face Layer: Face layer of wallboard attached to resilient channels through base layer using 1-5/8 inch Type S drywall screws spaced 12 inches on center. Edge joints of wallboard face layer offset 24 inches from those of base layer. Additionally, wallboard face layer attached to base layer with 1-1/2 inch Type G drywall screws spaced 8 inches on center, placed 1-1/2 inches from face layer end joints.
6. **Finish System (not shown):** Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

Fire Test conducted at National Research Council of Canada Report No. A-4440.1 June 24, 1997

STC and IIC Sound Ratings for Listed Assembly

Without Gypsum Concrete				With Gypsum Concrete			
Cushioned Vinyl		Carpet & Pad		Cushioned Vinyl		Carpet & Pad	
STC	IIC	STC	IIC	STC	IIC	STC	IIC
-	-	54	68	-	-	58[c]	55[c]

[a] This assembly may also be used in a fire-rated roof/ceiling application, but only when constructed exactly as described.

[b] Direct attachment of gypsum wallboard in lieu of attachment to resilient channels is typically deemed acceptable. When gypsum wallboard is directly attached to the I-joists, the wallboard should be installed with long dimension perpendicular to the I-joists and sound ratings for WIJ-1.5 should be used.

[c] STC and IIC values estimated by David L. Adams Associates, Inc

January 2009

Cost Impact: The code change proposal will not increase the cost of construction.

FS122-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T721.1(3) #1-FS-FRANCIS

FS123 – 12
Table 721.1(3)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

TABLE 721.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a, q]

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				THICKNESS OF FLOOR OR CEILING (inches)			
			4 hours	3 hours	2 hours	1 hours	4 hou rs	3 hours	2 hours	1 hours
28. Wood I-joist (minimum I-joist depth 91/4" with a minimum flange depth of 11/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c. Unfaced fiberglass insulation or mineral wool insulation is installed between the joists supported on the upper surface of the flange by stay wires spaced 12" o.c.	28-1.1	Base layer of $^{3}/_{8}$" Type C gypsum wall-board attached directly to I-joists with $1^{3}/_{8}$" Type S drywall screws spaced 12" o.c. with ends staggered. Minimum 0.0179" thick hat-shaped $^{7}/_{8}$ -inch furring channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by $1^{5}/8$ " Type S drywall screws after the base layer of gypsum wall-board has been applied. The middle and face layers of $^{5}/_{8}$ " Type C gypsum wall- board applied perpendicular to the channel with end joints staggered. The middle layer is fastened with 1" Type S drywall screws spaced 12" o.c. The face layer is applied parallel to the middle layer but with the edge joints offset 24" from those of the middle layer and	—	—	—	Varies	—	—	2 ¾	—

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				THICKNESS OF FLOOR OR CEILING (inches)			
			4 hours	3 hours	2 hours	1 hours	4 hou rs	3 hours	2 hours	1 hours
		fastened with $1^{5}/_{8}$ " Type S drywall screws 8" o.c. The joints shall be taped and covered with joint compound.								

(Portions of table not shown remain unchanged)

Reason: The IBC treats glass fiber insulation and mineral wool insulation as interchangeable in parallel in most applications in this Table. This particular assembly in Section 721 does not identify miner fiber insulation as being permitted. Since mineral wool insulation performs at least as well as glass fiber insulation under fire conditions, it should be added to this design.

Cost Impact: This proposal should not increase the cost of construction.

FS123-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T**721.1(3)-FS-CRIMI**

FS124 – 12
Table 721.1(3)

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

TABLE 721.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a, q]

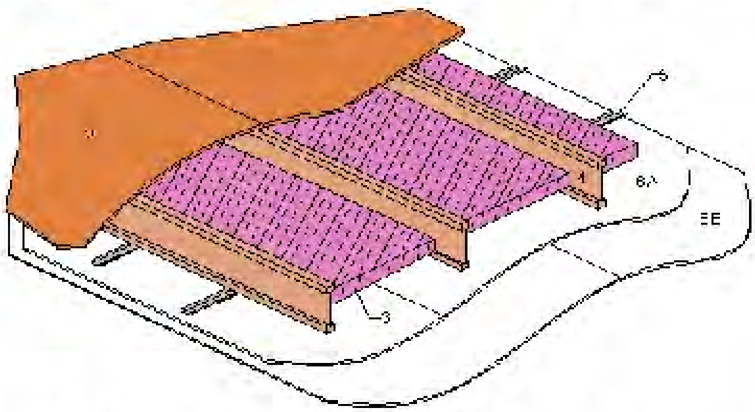
FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
30. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c. Fiberglass insulation placed between I-joists supported by the resilient channels.	30-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by 1-1/4" Type S drywall screws. Two Layers of ½" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1

(Portions of table not shown remain unchanged)

Reason: Many code officials have come to rely upon Table 721 as the preferred source of information regarding fire resistance rated assemblies. Because of its importance, we believe that the table should offer the most common generic assemblies. Floor systems utilizing I-joists have increased from less than 10 percent in 1990 to more than 50 percent. With the increased prevalence of I-joist floor/ceiling assemblies, including this assembly in the table will make the IBC more complete and it will be more useful to code officials. It is also expected that the document will be "user friendly", particularly for designers. In an effort to fulfill this expectation, we propose this common assembly for incorporation into Table 721.1(3). It is supported by ASTM E-119 test results as shown on the attached page. The following information and test results are provided with the understanding that their inclusion does not place them within the copyright release requirements of the signature statement.

WIJ-1.7 One-Hour Fire-Resistive Ceiling Assembly

Floor[a]/Ceiling - 100% Design Load - 1 Hour Rating - ASTM E 119 / NFPA 251



1. Floor Topping (optional, not shown): Gypsum concrete, lightweight or normal concrete topping.
2. Floor Sheathing: Minimum 23/32 inch thick tongue-and-groove wood sheathing (Exposure 1). Installed per code requirements with minimum 8d common nails.
3. Insulation: Fiberglass insulation placed between I-joists supported by the resilient channels.
4. Structural Members: Wood I-joists spaced a maximum of 24 inches on center.

Minimum I-joist flange depth: 1-1/2 inches
Minimum I-joist web thickness: 3/8 inch
Minimum I-joist flange area: 2.25 inches^2
Minimum I-joist depth: 9-1/2 inches

See ASTM D 5055-07 for qualification requirements.

5. Resilient Channels: Minimum 0.019 inch thick galvanized steel resilient channel attached perpendicular to the bottom flange of the I-joists with one 1-1/4 inch drywall screw. Channels spaced a maximum of 16 inches on center [24 inches on center when I-joists are spaced a maximum of 16 inches on center].
6. Gypsum Wallboard: Two layers of minimum 1/2 inch Type X gypsum wallboard attached with the long dimension perpendicular to the resilient channels as follows:

6a. Wallboard Base Layer: Base layer of wallboard attached to resilient channels using 1-1/4 inch Type S drywall screws at 12 inches on center.

6b. Wallboard Face Layer: Face layer of wallboard attached to resilient channels through base layer using 1-5/8 inch Type S drywall screws spaced 12 inches on center. Edge joints of wallboard face layer offset 24 inches from those of base layer. Additionally, wallboard face layer attached to base layer with 1-1/2 inch Type G drywall screws spaced 8 inches on center, placed 1-1/2 inches from face layer end joints.

7. Finish System (not shown): Face layer joints covered with tape and coated with joint compound. Screw heads covered with joint compound.

Fire Test conducted at National Research Council of Canada   Report No: A-4219.13.2   March 23, 1998

STC and IIC Sound Ratings for Listed Assembly							
Without Gypsum Concrete				**With Gypsum Concrete**			
Cushioned Vinyl		**Carpet & Pad**		**Cushioned Vinyl**		**Carpet & Pad**	
STC	**IIC**	**STC**	**IIC**	**STC**	**IIC**	**STC**	**IIC**
59	50	55 [b]	68 [b]	65	51	63 [b]	65 [b]

[a] This assembly may also be used in a fire-rated roof/ceiling application, but only when constructed exactly as described.

[b] STC and IIC values estimated by David L. Adams Associates, Inc

Cost Impact: The code change proposal will not increase the cost of construction.

FS124-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T721.1(3) #2-FS-FRANCIS

FS125 – 12
722.2.2.1

Proponent: Jason J. Krohn, P.E., representing the Precast/Prestressed Concrete Institute (jkrohn@pci.org)

Revise as follows:

722.2.2.1 Reinforced and prestressed floors and roofs. The minimum thicknesses of reinforced and prestressed concrete floor or roof slabs for *fire-resistance ratings* of 1 hour to 4 hours are shown in Table 722.2.2.1.

> **Exception:** Minimum thickness shall not be required for floors and ramps within open and enclosed parking garages constructed in accordance with Sections 406.5 and 406.6, respectively.

Reason:
1. Section 712.1.9 permits floor openings for automobile ramps in open and enclosed parking garages without shaft enclosures.
2. Exception 5 of Section 715.1 does not require fire-resistant joint systems for floors and ramps within open and enclosed parking garages or structures.

Referenced standard ACI 216.1-07, *Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies,* states that the purpose of the minimum thickness requirements (Section 722.2.2.1) is for "barrier fire resistance." It can be concluded from section 712.1.9 and 715.1 that there is no intent of creating a fire barrier between floors and ramps in open and enclosed parking garages. Therefore, there is no logic in requiring a minimum thickness for floors and ramps of open and enclosed parking garages due to heat transmission theory.

Even with this proposed exception, Section 722.2.3 requires the minimum thickness of concrete cover over reinforcement which is necessary to preserve the structural integrity of the floors and can be used to meet the structural end point criteria. Section 722.2.3 specifies the concrete cover protection for the purposes of maintaining fire endurance of the structural element.

Cost Impact: The code change proposal will not increase the cost of construction.

FS125-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

722.2.2.1-FS-KROHN

FS126 – 12
722.5.1.2.1, Figure 722.5.1(2), Figure 722.5.1(3)

Proponent: Michael Gardner, representing Gypsum Association (mgardner@gypsum.org)

Revise as follows:

722.5.1.2.1 Attachment. The gypsum ~~wallboard~~ board or gypsum panel products shall be supported as illustrated in either Figure 722.5.1(2) for fire-resistance ratings of 4 hours or less, or Figure 722.5.1(3) for fire-resistance ratings of 3 hours or less.

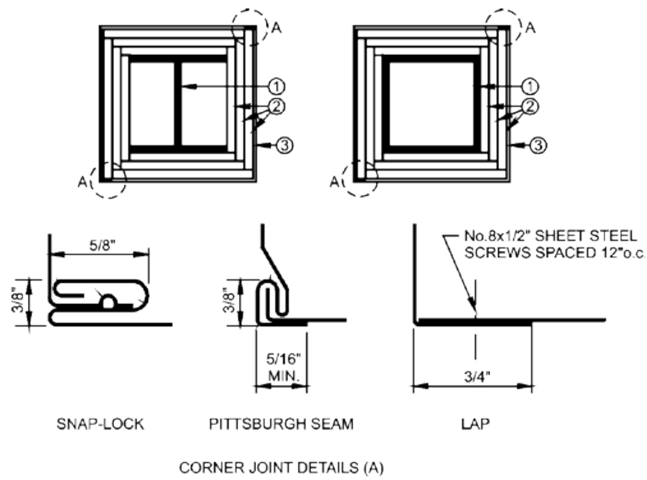


FIGURE 722.5.1(2)
GYPSUM ~~WALLBOARD~~ PROTECTED STRUCTURAL STEEL COLUMNS WITH SHEET STEEL COLUMN COVERS

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.
1. Structural steel column, either wide flange or tubular shapes.
2. Type X gypsum board or ~~wallboard~~ gypsum panel products in accordance with ASTM ~~C 36~~ C 1177, C 1178, C 1278, C 1396 or C 1658. The total thickness of gypsum board or gypsum panel products calculated as *h* in 722.5.1.2, shall be applied vertically to an individual column using one of the following methods:
   1. As a single layer with no horizontal joints.
   2. As multiple layers with no horizontal joints permitted in any layer.
   3. As multiple layers with horizontal joints staggered not less than 12 inches vertically between layers and not less than 8 feet vertically in any single layer. ~~For single-layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple-layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches.~~ The total required thickness of ~~wallboard~~ gypsum board or gypsum panel products shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (*W/D*) of the column. For fire-resistance ratings of 2 hours or less, one of the required layers of gypsum ~~wallboard~~ board or gypsum panel product may be applied to the exterior of the sheet steel column covers with 1-inch long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149-inch minimum thickness galvanized steel corner beads with 11/2- inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.

3. For fire-resistance ratings of 3 hours or less, the column covers shall be fabricated from 0.0239-inch minimum thickness galvanized or stainless steel. For 4-hour fire-resistance ratings, the column covers shall be fabricated from 0.0239-inch minimum thickness stainless steel. The column covers shall be erected with the Snap Lock or Pittsburgh joint details. For fire-resistance ratings of 2 hours or less, column covers fabricated from 0.0269-inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints. The lap joints shall be permitted to be located anywhere around the perimeter of the column cover. The lap joints shall be secured with 1/2-inch-long No. 8 sheet metal screws spaced 12 inches on center. The column covers shall be provided with a minimum expansion clearance of 1/8 inch per linear foot between the ends of the cover and any restraining construction.

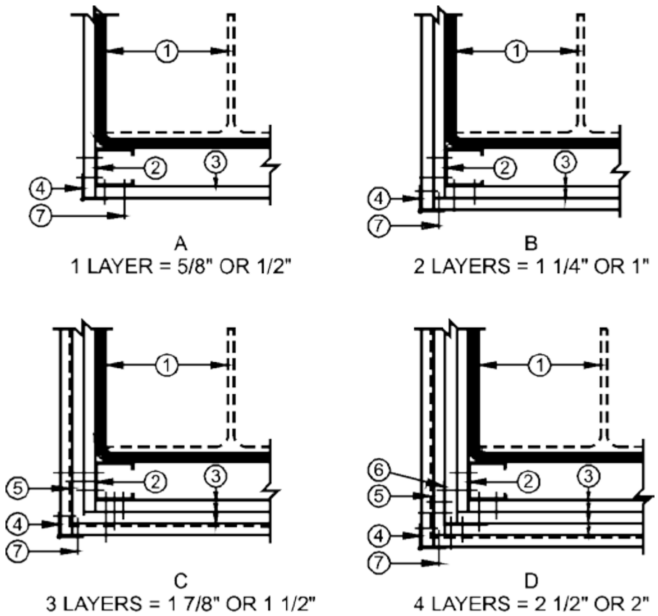


FIGURE 722.5.1(3)
GYPSUM ~~WALLBOARD~~ PROTECTED STRUCTURAL STEEL COLUMNS WITH STEEL STUD/SCREW ATTACHMENT SYSTEM

For SI: 1 inch = 25.4 mm, 1 foot = -305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. $1^{5}/_{8}$-inch deep studs fabricated from 0.0179-inch minimum thickness galvanized steel with 15/16 or 17/16-inch legs. The length of the steel studs shall be 1/2 inch less than the height of the assembly.
3. Type X gypsum board or gypsum panel products ~~wallboard~~ in accordance with ASTM ~~C36~~ C177, C1178, C1278, C1396 pr C1658. The total thickness of gypsum board or gypsum panel products calculated as *h* in 722.5.1.2, shall be applied vertically to an individual column using one of the following methods:
   1. As a single layer with no horizontal joints.
   2. As multiple layers with no horizontal joints permitted in any layer.
   3. As multiple layers with horizontal joints staggered not less than 12 inches vertically between layers and not less than 8 feet vertically in any single layer ~~For single-layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple-layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches.~~ The total required thickness of ~~wallboard~~ gypsum board or gypsum panel products shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (*W/D*) of the column.
4. Galvanized 0.0149-inch minimum thickness steel corner beads with 11/2-inch legs attached to the ~~wallboard~~ gypsum board or gypsum panel products with 1-inch-long Type S screws spaced 12 inches on center.
5. No. 18 SWG steel tie wires spaced 24 inches on center.
6. Sheet metal angles with 2-inch legs fabricated from 0.0221-inch minimum thickness galvanized steel.
7. Type S screws, 1 inch long, shall be used for attaching the first layer of ~~wallboard~~ gypsum board or gypsum panel product to the steel studs and the third layer to the sheet metal angles at 24 inches on center. Type S screws 13/4-inch long shall be used for attaching the second layer of ~~wallboard~~ gypsum board or gypsum panel product to the steel studs and the fourth layer to the sheet metal angles at 12 inches on center. Type S screws 21/4 inches long shall be used for attaching the third layer of ~~wallboard~~ gypsum board or gypsum panel product to the steel studs at 12 inches on center.

Reason: The existing language requirement that prohibits the installation of horizontal joints in a single-layer protection system is occasionally overlooked or ignored. In addition, the phrase requiring a "minimum spacing of 8 feet between joints" is being misinterpreted and applied to the horizontal distance between joints in adjacent columns and not the joints in a single column.

Proposal presents the language in a clearer format that is intended to specifically define the three possible application methods for the gypsum board or gypsum panel protection system.

To clarify that materials other than gypsum wallboard can be used to achieve the desired fire-resistance-rating, the proposal inserts language acknowledging that Type X gypsum panel products – gypsum products manufactured without a paper facing – and gypsum board materials other than gypsum wallboard may be used to achieve the desired fire-resistance rating.

Cost Impact: No change to the cost of construction.

FS126-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

722.5.1.2.1-FS-GARDNER

FS127 – 12
722.6.1.2

Proponent: Larry Wainright, Qualtim, representing the Structural Building Components Association (lwainright@qualtim.com)

Revise as follows:

722.6.1.2 Dissimilar membranes. Where dissimilar membranes are used on ~~a~~ an interior wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.

Reason: To avoid confusion between the requirements for interior and exterior walls. Except where required elsewhere in the code to have fire resistance calculated for exterior exposure, the requirements for exterior walls apply only exposure from the interior of the structure (722.6.2.3). This language is intended to provide clarity and is not intended to change any requirement of the code.

Cost Impact: This proposal will not increase the cost of construction.

FS127-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

722.6.1.2-FS-WAINRIGHT

FS128 – 12
702.1, Table 722.6.2(3), 2603.5.7

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, Products in Fibre-reinforced Cement and self

Revise as follows:

702.1 Definitions. The following terms are defined in Chapter 2:

FIBER-CEMENT SIDING

TABLE 722.6.2(3)
MEMBRANE[a] ON EXTERIOR FACE OF WOOD STUD WALLS

SHEATHING	PAPER	EXTERIOR FINISH
5/8 – inch T & G lumber 5/16 – inch exterior glue wood structural panel ½ - inch gypsum wallboard 5/8 – inch gypsum wallboard ½ - inch fiberboard	Sheathing paper	Lumber siding Wood shingles and shakes ¼-inch fiber-cement lap, panel or shingle siding ¼-inch wood structural panels-exterior type ¼-inch hardboard Metal siding Stucco on metal lath Masonry veneer Vinyl siding
None		3/8 – inch exterior-grade wood structural panels

For SI: 1 pound/cubic foot = 16.0185 kg/m2.
a. Any combination of sheathing, paper and exterior finish is permitted.

Revise as follows:

2603.5.7 Ignition. Exterior walls shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed.

Exception: Assemblies protected on the outside with one of the following:

1. A thermal barrier complying with Section 2603.4.
2. A minimum 1 inch (25 mm) thickness of concrete or masonry.
3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8 inch (9.5 mm).
4. Metal-faced panels having minimum 0.019-inchthick (0.48 mm) aluminum or 0.016-inch-thick (0.41 mm) corrosion-resistant steel outer facings.
5. A minimum 7/8 inch (22.2 mm) thickness of stucco complying with Section 2510.
6. A minimum ¼-inch (6.4 mm) thickness of fiber-cement lap, panel or shingle siding complying with Section 1405.16 and 1405.16.1 or 1405.16.2.

Reason:
1. A revision to Table 722.6.2(3) is proposed to include "fiber-cement lap, panel and shingle siding". The term "fiber-cement products" is proposed to be included in the definitions here consistent with the definition published in the Terminology Standard ASTM C1154-06, *Standard Terminology for Non-Asbestos Fiber-Reinforced Cement Products* (see attached Standard) and also proposed for revision in Chapter 2 of the IBC code.
2. The application of ¼-inch fiber-cement lap, panel or shingle siding complying with ASTM C1186, Type A (or ISO 8336 Category A) provides less potential for flame spread and smoke developed than the current wood-based and vinyl siding products currently recognized for use in this table. Fiber-cement siding having a flame spread of 0 and smoke developed index

of 5 or less as required in the referenced specifications (see attached ICC-ES ESR-1381[reference Section 3.0], ESR-1572[reference Section 3.0], ESR-1844[reference Section 3.1], ESR-2290[reference Section 3.1], and ESR-2894[reference Section 3.2] as supporting documents) provides a greater level of fire protection than the wood or vinyl siding currently permitted under Section 722.6.2.3 of the Code.

3. ¼-inch thick fiber-cement product complying with the provisions of Section 1405.16 ("complying with the requirements of ASTM C1186, Type A, minimum Grade II [or ISO 8336, Category A, Class 2]) has a flame spread of 0 and smoke developed index of 5 or less. The proposed fiber-cement siding is also classed as noncombustible in accordance with ASTM E 136 (see ICC-ES ESR-1381[reference Section 3.0], ESR-1572[reference Section 3.0], ESR-1844[reference Section 3.1], ESR-2290[reference Section 3.1], and ESR-2894[reference Section 3.2]) documenting these claims (http://www.icc-es.org/).

Cost Impact: The code change proposal will not increase the cost of construction because the change only adds a new term to the definitions section of Chapter 7, and because the proposed addition of fiber-cement siding products to the table [(722.6.2(3)] and to the exceptions (2603.5.7) only provides for the choice and use of a type of siding product having greater fire resistance.

FS128-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

702 FIBER CEMENT PRODUCTS-FS-FULDER AND T722.6.2(3)-FS-MULDER-2603.5.7-FES-MULDER

FS129 – 12
Table 722.6.2(4)

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, *Products in Fibre-reinforced Cement* and Self

Revise as follows:

TABLE 722.6.2(4)
FLOORING OR ROOFING OVER WOOD FRAMING[a]

ASSEMBLY	STRUCTURAL MEMBERS	SUBFLOOR OR ROOF DECK	FINISHED FLOORING OR ROOFING
Floor	Wood	$^{15}/_{32}$ – inch wood structural panels or $^{11}/_{16}$ – inch T & G softwood	Hardwood or softwood flooring on building paper<u>,</u> resilient flooring, parquet floor<u>,</u> felted-synthetic fiber floor covering, carpeting or ceramic tile on <u>¼-inch-thick fiber-cement underlayment or ceramic tile</u> on 3/8-inch-thick panel type underlay Ceramic tile on $1^1/_4$-inch mortar bed
Roof	Wood		Finished roofing material with or without insulation

For SI: 1 pound/cubic foot = 16.0185 kg/m2.
a. Any combination of sheathing, paper and exterior finish is permitted.

Reason: Add comma between building paper and resilient flooring and between parquet floor and felted-synthetic fiber floor covering to clean up the language. ¼-inch fiber-cement underlayment (having a flame spread of 0 and smoke developed index of 5 or less as required in the referenced product specifications (ASTM C1288, Grade II) or [ISO 8336, Type C, Class 2]) provides a greater level of fire protection than the wood panel-type underlay currently permitted under Section 722.6.2.4 of the Code. The proposed fiber-cement underlayment is also classed as noncombustible in accordance with ASTM E 136 (see ICC-ES ESR-1381[reference Section 3.0], ESR-2280[reference Section 3.1], and ESR-2292[reference Section 3.0]) as supporting documentation (http://www.icc-es.org/).

Cost Impact: The code change proposal will not increase the cost of construction because the proposed addition of fiber-cement underlayment products to the table only provides for the choice and use of a type of underlayment product having greater fire resistance than the product currently recognized.

FS129-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

722.6.2(4)-FS-MULDER

FS130 – 12
722.6.3

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Delete without substitution:

~~**722.6.3 Design of fire-resistant exposed wood members.** The fire-resistance rating, in minutes, of timber beams and columns with a minimum nominal dimension of 6 inches (152 mm) is equal to:~~

~~Beams: 2.54Zb [4 -2(b/d)] for beams which may be exposed to fire on four sides.~~ ~~(Equation 7-18)~~

~~2.54Zb [4 -(b/d)] for beams which may be exposed to fire on three sides.~~ ~~(Equation 7-19)~~

~~Columns: 2.54Zd [3 -(d/b)] for columns which may be exposed to fire on four sides~~ ~~(Equation 7-20)~~

~~2.54Zd [3 -(d/2b)] for columns which may be exposed to fire on three sides.~~ ~~(Equation 7-21)~~

~~where:~~

~~b = The breadth (width) of a beam or larger side of a column before exposure to fire (inches).~~
~~d = The depth of a beam or smaller side of a column before exposure to fire (inches).~~
~~Z = Load factor, based on Figure 722.6.3(1).~~

~~**722.6.3.1 Equation 7-21.** Equation 7-21 applies only where the unexposed face represents the smaller side of the column. If a column is recessed into a wall, its full dimension shall be used for the purpose of these calculations.~~

~~**722.6.3.2 Allowable loads.** Allowable loads on beams and columns are determined using design values given in AF&PA NDS.~~

~~**722.6.3.3 Fastener protection.** Where minimum 1- hour *fire resistance* is required, connectors and fasteners shall be protected from fire exposure by 11/2 inches (38 mm) of wood, or other *approved* covering or coating for a 1-hour rating. Typical details for commonly used fasteners and connectors are shown in AITC Technical Note 7.~~

~~**722.6.3.4 Minimum size.** Wood members are limited to dimensions of 6 inches (152 mm) nominal or greater. Glued-laminated timber beams utilize standard laminating combinations except that a core lamination is removed. The tension zone is moved inward and the equivalent of an extra nominal 2-inch-thick (51 mm) outer tension lamination is added.~~

~~**FIGURE 722.6.3(1)**~~
~~**LOAD FIGURE**~~

~~*Ke* = The effective length factor as noted in Figure 722.6.3(2).~~
~~*l* = The unsupported length of columns (inches).~~

~~**FIGURE 722.6.3(2)**~~
~~**EFFECTIVE LENGTH FACTORS**~~

Reason: A more robust design methodology for designing these members is contained in Chapter 16 of *the National Design Specification for Wood construction (NDS).* This ANSI consensus standard is referenced in 722.1.

Cost Impact: The code change proposal will not increase the cost of construction.

FS130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

722.6.3-FS-FRANCIS

FS131 – 12
803.2

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

803.2 Thickness exemption. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested if the surface to which they are applied complies with the requirements of section 703.5.1 or of section 703.5.2, as appropriate.

Reason: This section is intended to avoid the need to test very thin materials (such as the paper covering on gypsum board or other thin layers) applied directly to noncombustible surfaces. That is very reasonable, since very thin layers will not add a significant level of fire safety to a surface when there is no significant flame spread from the substrate itself.

Unfortunately, however, this section has been used as the excuse for applying facings or veneers to wood surfaces and having them exempted. In that case the interpretation of this section results in the use of materials where there is no fire testing of the facing or veneer and no fire testing of the composite system (i.e. the facing or veneer and the wood backing).

If the surface is an untreated wood surface (with a typical flame spread index of 100-200), adding a combustible facing or veneer (and the corresponding adhesive) is likely to increase the flame spread index to exceed 200 and thus to go from a Class C to an unclassified material. If the surface is a fire-retardant-treated wood (FRTW) surface (with always has a flame spread index of less than 25), the effect of adding a combustible facing or veneer (which is not composed of FRTW) together with the corresponding adhesive, is virtually guaranteed to increase the flame spread index so as to exceed 25 and thus to go from a material classified as a Class A material to one classified as a Class B or worse. Note that specific test results cannot be presented because the available information is based on proprietary tests.

Please note that this code change proposal would not affect gypsum board as the language of section 703.5 of the IBC was specifically designed so that gypsum board is classified as a noncombustible material, in accordance with 703.5.2, as shown below:

703.5 Noncombustibility tests. The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Type I, II, III and IV construction. The term “noncombustible” does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

703.5.1 Elementary materials. Materials required to be noncombustible shall be tested in accordance with ASTM E 136.

703.5.2 Composite materials. Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 or UL 723 shall be acceptable as noncombustible materials.

Cost Impact: None

FS131-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

803.2-FS-HIRSCHLER

FS132 – 12
803.3

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

803.3 Heavy timber exemption. Exposed portions of ~~structural~~ ~~members~~ building elements complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to *interior finish* requirements.

Reason: "Structural members" is not a well defined term. Building Elements is a term used in Table 601 to refer to various structural members. The various members in Table 601 are part of the structural frame concept upon which the table is based. The intent here is to use an expression which is familiar to the user and understandable to the enforcer and practitioner.

Cost Impact: The code change proposal will not increase the cost of construction.

FS132-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

803.3-FS-FRANCIS

FS133 – 12
202, 803.14 (New), 803.14.1 (New), 803.14.2 (New)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Scranton Products (jbeitel@haifire.com)

Revise definition as follows:

INTERIOR WALL AND CEILING FINISH. The exposed *interior surfaces* of buildings, including but not limited to: fixed or movable walls and partitions; ~~toilet room privacy partitions;~~ columns; ceilings; and interior wainscoting, paneling or other finish applied structurally or for decoration, acoustical correction, surface insulation, structural fire resistance or similar purposes, but not including *trim*.

Add new text as follows:

803.14 Toilet Room Privacy Partitions. Toilet room privacy partitions shall comply with the requirements of 803.14.1 and 803.14.2.

803.14.1 Flame-spread. Toilet room privacy partitions shall comply with 803.1.1.

803.14.2 Full-scale Testing. If the toilet room privacy partitions exhibit melting or dripping during the ASTM E 84 or UL 723 test, the toilet room privacy partition shall also comply with the requirements of 803.1.2.

Reason: Currently, toilet room partitions must be tested to ASTM E84 or UL 723 (Section 803.1.1). However, if the toilet room privacy partition is constructed of high-density polyethylene or polypropylene then Section 803.12 requires that the material must be tested per NFPA 286 (Section 803.1.2).

Section 803.12 was developed to address the specific issue of melting and dripping materials that might provide a Flame-spread Index that is not indicative of their actual performance. Based on previous full-scale fire testing which identified the burning of melting and dripping material as a potential hazard, the NFPA 286 fire testing was required. One example used to justify this Code section was toilet room privacy partitions.

However, if a high-density polyethylene or polypropylene can be formulated for this application and which show that melting and dripping does not occur, then these products should be allowed to only be tested per ASTM E 84 or UL 723.

Additionally, if melting and dripping is an issue for some polymeric materials used in this application, then the same requirements should be applied to all other polymeric materials used in this application. This Code proposal addresses these issues in the proposed new section.

Cost Impact: The Code change proposal will increase the cost of construction because for those materials used in this application that melt and drip and are not subject to section 803.12, additional testing will be required.

FS133-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

803.14 (NEW)-FS-BEITEL

FS134________ – 12
901.1

Proponent: Tom Allen, City of Mount Dora, FL, representing self

Revise as follows:

901.1 Scope. The provisions of this chapter shall specify where fire protections systems are required and shall apply to the design, installation and operation of fire protection systems <u>and carbon monoxide alarms and detection systems.</u>

Reason: Adds carbon monoxide detection to scope of chapter 9, goes with new section 916.

Cost Impact: There is not a cost impact.

Analysis: The "new section 916" mentioned in the reason statement is a Group B code change to be heard by the IFC code development committee.

FS134-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

901.1-FS-ALLEN

FS135-12

909.10.3 (New) (IFC 909.10.3 (New)), Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

909.10.3 Fire-resistance Rated Duct Enclosures. Where ducts form part of a required *smoke control* system and penetrate a fire-resistance rated wall assemblies or *horizontal assembly*, they shall comply with the requirements of ASTM E2816.

> **Exception:** Where the installation of a *smoke or fire damper* will not interfere with the operation of a required smoke control system in accordance with Section 909, penetrations by ducts and air transfer openings are permitted to comply with Section 717.

(Renumber subsequent sections)

Add new standard to Chapter 35 as follows:

ASTM

E2816-11. Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal would require HVAC ducts installed as part of a required smoke control system to be protected by a tested and listed assembly conforming to the new ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems evaluated for the specific purpose. In addition, an exception to comply with section 717 is incorporated. This principle of protecting HVAC ducts used as part of a smoke control system from the effects of fire exposure is already contained in section 909.4 as part of a rational analysis supporting the design of smoke control systems to be employed. Section 909.4.4 requires that the design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis must include all permutations of systems status, and the design shall consider the effects of the fire on the HVAC systems.

This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting multiple stories.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by fire resistance rated construction when the HVAC duct system is exposed to fire from the outside of the horizontal or vertical HVAC duct system, or from the outside with hot gases entering the inside of the HVAC duct system from unprotected openings, when subjected to the standard time-temperature curve of ASTM E119.

Cost Impact: This change will not affect the cost of construction.

Analysis: FS58, Part II and FS 135 contain similar requirements for ducts that form smoke control systems. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS135-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.10.3 (NEW)-FS-CRIMI

FS136 – 12
909.20.5.1 (New), Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Add new text as follows:

909.20.5.1 Stair Pressurization Ducts. Where interior *exit stairways* are pressurized, HVAC ducts used to supply uncontaminated air shall be protected with a shaft enclosures in accordance with Section 713, or tested in accordance with ASTM E2816.

Add new standard to Chapter 35 as follows:

ASTM
E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal would require HVAC ducts installed for the purposes of stairwell pressurization to be enclosed within a shaft or protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems e*valuated for the specific purpose. The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by fire resistance rated construction when the HVAC duct system is exposed to fire from the outside of the horizontal or vertical HVAC duct system, or from the outside with hot gases entering the inside of the HVAC duct system from unprotected openings, when subjected to the standard time-temperature curve of ASTM E119. This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting multiple stories.

The purpose of a closed pressurization system is to provide fresh air directly to stairwells or egress areas. This design air pressures need to be sufficient to maintain closed doors while preventing smoke from entering the egress path. . Smoke control systems have been required in nearly two thirds of the United States for over a decade. High-rise buildings constructed to the requirements of International Building Code, but without any specific measures to control smoke migration, are all the more vulnerable to property damage and occupants' loss of life.

Pressurization results in airflows of high velocity in the gaps around closed doors and construction cracks, thereby preventing smoke from flowing back into the pressurized space through these openings. Pressurized stairwells are provided with the goal of maintaining a tenable environment within the escape routes in the event of a building fire. While the option to use stairwell pressurization exists, the IBC does not require stairwell pressurization in high-rise buildings, and only requires smoke control in underground buildings, atriums, and covered mall buildings. Section 403.5.4 of the 2012 IBC requires smokeproof exit enclosures for high-rise buildings in every required stairway serving floors more than 75 feet (22.86 m) above the ground. Section 909.20.5 merely permits sprinklered buildings to use stairwell pressurization as an alternate to the smokeproof enclosures. When employed, ducts used for Stair pressurization to provide uncontaminated air within required interior exit stairwells or areas of egress need to be protected from the effect of fire, or constructed as fire resistant systems.

This principle of protecting HVAC ducts used as part of a smoke control system from the effects of fire exposure is already contained in section 909.4 as part of a rational analysis supporting the design of smoke control systems to be employed. Section 909.4.4 requires that the design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis must include all permutations of systems status, and the design shall consider the effects of the fire on the HVAC systems.

Particularly in the case of tall buildings, the predominant factors that cause smoke movement are stack effects, the affect of external wind forces, and forced air movement within the building. Smoke removal and venting practices are complicated by stack effects, which will tend to favour natural air movement vertically through the building as a results of differences in temperature and densities between the inside and outside air. [1]

Options such as the use of natural ventilation are only available where openings in exterior stairwells can be accommodated. Even then, a number of problems have been identified with this approach. Firstly, the required volume of fresh air is high. Secondly, natural supply and exhaust through vents may be subject to adverse exterior wind conditions, and even when functioning satisfactorily, would generally require vents located on different exterior walls. Thirdly, the performance of natural vents is influenced by building stack effects, which may be particularly significant on the upper or lowermost stories for tall buildings. This effect can range from either strong inflow or strong outflow from all natural vents on a given storey.[2]

Bibliography:
1. Klote, J.H. and Milke, J.A. Fire Protection Handbook, NFPA 19th Edition, Volume II, Smoke Movement in Buildings, Chapter 6, Section 12-113 –12-126
2. Building Research Establishment, UK, Smoke Ventillation of Common Access Areas of Flats & Maisonettes (BD2410), Final Factual Report, Appendix A (Review), BRE Ltd, 2005

Cost Impact: This change will not affect the cost of construction.

Analysis: FS58, Part III and FS 136 contain similar requirements for stair pressurization ducts. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS136-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.20.5.1-FS-CRIMI

FS137 – 12
909.20.6.1, 909.20.6.2 (New), Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

909.20.6.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, or with ductwork conforming to 909.20.6.2.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, or with ductwork conforming to 909.20.6.2.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, or with ductwork conforming to 909.20.6.2.

909.20.6.2 Smokeproof enclosure ductwork. Ductwork tested and *listed* to have not less than 2-hour fire-resistance in accordance with ASTM E2816 shall be permitted to enclose equipment, control wiring, power wiring and ductwork required to comply with 9.20.6.1.

Add new standard to Chapter 35 as follows:

ASTM
E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal would allow an additional tested method of protection for enclosures used to protect equipment, control wiring, power wiring and ductwork required by 9.20.6.1. The enclosures or ductwork would be permitted to be used if it were protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems e*valuated for the specific purpose. This Standard has criteria for testing rigid or flexible fire protection enclosure systems (including stability, integrity, and insulation) that are installed on or as part of metallic HVAC ducts, yielding an alternate to required fire-resistance-rated shafts which are required to be protected from both internal and external fire exposure. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by fire resistance rated construction when the HVAC duct system is exposed to fire from the outside of the horizontal or vertical HVAC duct system, or from the outside with hot gases entering the inside of the HVAC duct system from unprotected openings, when subjected to the standard time-temperature curve of ASTM E119. This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting multiple stories.

This principle of protecting HVAC ducts used as part of a smoke control system from the effects of fire exposure is already contained in section 909.4 as part of a rational analysis supporting the design of smoke control systems to be employed. Section 909.4.4 requires that the design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis must include all permutations of systems status, and the design shall consider the effects of the fire on the HVAC systems.

Cost Impact: This change will reduce the cost of construction.

Analysis: FS58, Part IV, FS 137 and FS139 contain similar requirements for smokeproof enclosure ventilation systems. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS137-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.20.6.1-FS-CRIMI

FS138 – 12
202 (New), 909.20.6.1, 3007.9.1, 3008.9

Proponent: Vickie Lovell, InterCode Incorporated representing 3M Company (vickie@intercodeinc.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new definition as follows:

<u>**ELECTRICAL CIRCUIT PROTECTIVE SYSTEM.** A specific construction of devices, materials, or coatings installed as a fire resistive barrier system applied to electrical system components, such as cable trays, conduits and other raceways, open run cables and conductors, cables, and conductors.</u>

Revise as follows:

909.20.6 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the *stair* shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.6.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable<u>.</u> ~~or cable system~~
2. Where encased with not less than 2 inches (51 mm) of concrete.
3. <u>Control wiring and power wiring protected by a listed electrical circuit protective system with a *fire-resistance rating* of not less than 2 hours.</u>

Revise as follows:

3007.9 Electrical power. The following features serving each fire service access elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator hoistway lighting.
3. Elevator machine room *ventilation* and cooling equipment.
4. Elevator controller cooling equipment.

3007.9.1 Protection of wiring or cables. Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, *ventilation* and fire-detecting systems to fire service access elevators shall be protected by construction having a *fire-resistance rating* of not less than 2 hours, ~~or~~ shall be a circuit integrity cable having a *fire-resistance rating* of not less than 2 hours~~.~~, or shall be protected by a listed electrical circuit protective system having a *fire-resistance rating* of not less than 2 hours.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operations.

3008.9 Electrical power. The following features serving each occupant evacuation elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator machine room *ventilation* and cooling equipment.
3. Elevator controller cooling equipment.

3008.9.1 Protection of wiring or cables. Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, *ventilation* and fire-detecting systems to fire service access elevators shall be protected by construction having a *fire-resistance rating* of not less than 2 hours, or shall be circuit integrity cable having a *fire-resistance rating* of not less than 2 hours, or shall be protected by a listed electrical circuit protective system having a *fire-resistance rating* of not less than 2 hours.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operations.

Reason: This proposal is intended to add the option of using fire-resistive cables, which are tested to UL 2196 *Tests for Fire Resistive Cables*, and to include the option of using conventional cables with a protective material applied to the them. These materials are called electrical circuit protective systems.

Electrical circuit protective systems are already recognized by NFPA 70 the *National Electrical Code* for protection of fire pump control wiring, emergency system circuit wiring, and critical operations power system circuit wiring. The recognized standards to test fire-resistive electrical circuit protective systems are as follows:

- ASTM E1725 *Standard Test Methods for Fire Tests of Fire-Resistive Barrier systems for Electrical System Components*.
- UL 1724 *Fire Tests for Electrical Circuit Protective Systems*

The UL category for this designation of this type of protective system is FHIT.

This definition is a compilation of excerpts from the terminology section ASTM E1725 the *Standard Test Methods for Fire Tests of Fire-Resistive Barrier systems for Electrical System Components*.

Cost Impact: The code change proposal will not increase the cost of construction.

FS138-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.20.6.1-FS-LOVELL

FS139 – 12
909.20.6.1, Chapter 35

Proponent: Mark Lund, representing 3M Company, Fire Protection Products (mwlund@mmm.com)

Revise as follows:

909.20.6.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

   Exceptions:

   1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
   2. Where encased with not less than 2 inches (51 mm) of concrete.
   3. Ductwork tested and *listed* for not less than 2-hour fire-resistance in accordance with ASTM E2816

Add new standard to Chapter 35 as follows:

ASTM
E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal would allow an additional tested method of protection for enclosures used to protect equipment, control wiring, power wiring and ductwork required by 909.20.6.1. The enclosures or ductwork would be permitted to be used if it were protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose. This Standard has criteria for testing rigid or flexible fire protection enclosure systems (including stability, integrity, and insulation) that are installed on or as part of metallic HVAC ducts, yielding an alternate to required fire-resistance-rated shafts which are required to be protected from both internal and external fire exposure. This criteria provides an alternate to shaft enclosures for vertical ducts, and an alternate to fire dampers in horizontal ducts.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by fire resistance rated construction when the HVAC duct system is exposed to fire from the outside of the horizontal or vertical HVAC duct system, or from the outside with hot gases entering the inside of the HVAC duct system from unprotected openings, when subjected to the standard time-temperature curve of ASTM E119.

This principle of protecting HVAC ducts used as part of a smoke control system from the effects of fire exposure is already contained in section 909.4 as part of a rational analysis supporting the design of smoke control systems to be employed. Section 909.4.4 requires that the design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis must include all permutations of systems status, and the design shall consider the effects of the fire on the HVAC systems.

Cost Impact: This change will reduce the cost of construction.

Analysis: FS58, Part IV, FS 137 and FS139 contain similar requirements for smokeproof enclosure ventilation systems. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS139-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.20.6.1-FS-LUND

FS140 – 12
909.21.1

Proponent: Michael Perrino, CBO, Code Consultants, Inc., representing self

Revise as follows:

909.21.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

> **Exception:** The minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to occupied floors is not required at the floor of recall with the doors open.

Reason: The IBC requires the pressure difference, required for the pressurization alternative, to be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. There is not currently an exception for the measurement of the pressure at the floor of elevator recall.

Elevator hositway pressurization is intended to minimize smoke movement into an elevator shaft when a lobby is not provided. Meeting the required pressure difference on the recall floor with the hoistway doors open is not necessary, because the recall floor is protected by smoke detectors that will not allow the hoistway doors to open if smoke is present.

The pressurization method is based on using pressure differences produced by fans to minimize the spread of smoke across a barrier. A barrier will not exist on the recall floor when the hoistway doors are open and smoke detectors used for elevator recall prevent the doors from opening when smoke is present.

The intent of hositway pressurization is to create the pressure difference between the floor of origin (low pressure) and the elevator hoistway (high pressure) to minimize smoke movement into the shaft. However, both a primary and alternate recall floor are provided so that the floor of fire origin will not be the designated level of recall. Therefore, it is not necessary to create a pressure differential across the open hoistway doors on the level of recall, because the recall floor will not be the floor of fire origin.

Cost Impact: The code change proposal will not increase the cost of construction.

FS140-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.21.1-FS-PERRINO

FS141 – 12
909.21.1, 909.21.1.1(New)

Proponent: Jonathan Siu, representing City of Seattle Department of Planning & Development (jon.siu@seattle.gov)

Revise as follows:

909.21.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. <u>The pressure differentials shall be measured between the hoistway and the adjacent elevator landing.</u> The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

<u>**Exceptions:**</u>

1. <u>On floors containing only Group R occupancies, the pressure differential is permitted to be measured between the hoistway and a dwelling unit or sleeping unit.</u>
2. <u>Where an elevator opens into a lobby enclosed in accordance with Sections 3007.7 or 3008.7, the pressure differential is permitted to be measured between the hoistway and the space immediately outside the door(s) from the floor to the enclosed lobby.</u>
3. <u>The pressure differential is permitted to be measured relative to the outdoor atmosphere on floors other than the following:</u>
   - <u>3.1. The fire floor</u>
   - <u>3.2. The two floors immediately below the fire floor, and</u>
   - <u>3.3. The floor immediately above the fire floor</u>

<u>**909.21.1.1 Use of Ventilation Systems.** Ventilation systems, other than hoistway supply air systems, are permitted to be used to exhaust air from adjacent spaces on the fire floor, two floors immediately below, and one floor immediately above the fire floor to the building exterior where necessary to maintain the positive pressure relationships as required in 708.14.2.1 during the operation of the elevator shaft pressurization system.</u>

Reason: The purpose of this code change proposal is to introduce a method of measuring pressure differentials in pressurized hoistways.

The City of Seattle has had a long history of requiring pressurized hoistways in high rise buildings to prevent smoke migration. In 2005, the City of Seattle Department of Planning & Development (DPD) convened a committee which included representatives from industry, the Seattle Fire Department, and DPD, to decide whether to recommend changes to the high rise smoke migration control requirements in place at that time. The committee also consulted with Dr. John Klote, who suggested the approach that Seattle eventually adopted with some small modifications. This proposal takes the Seattle approach and adapts it to the 2012 IBC.

During the 2009/2010 code change cycle, a proposal was made to delete the hoistway pressurization requirements in the IBC without substitution (FS51-09/10), based on a study conducted by Drs. Miller and Beasley. This study showed that requiring the pressure differential of 0.10 inches of water column to be maintained at the recall floor with the elevator doors in the open position resulted in overpressurization of all the other floors—meaning the current standards in the code cannot be met. Based on further modeling by Dr. Miller, the proponent for FS51 submitted a public comment introducing Seattle's requirements into the IBC. The reason statement for the public comment stated Dr. Miller "concluded that the 'Seattle approach' does indeed meet all the prescriptive requirements of the IBC 2009." The proposal and its public comment were ultimately withdrawn by the proponent in anticipation of the formation of the CTC Elevator Lobby Study Group.

While not specifically endorsed by the CTC Elevator Lobby Study Group, the Seattle approach was discussed as one of several viable options for preventing smoke from entering hoistways. Unfortunately, the Study Group did not recommend any changes to the prescriptive hoistway pressurization requirements currently in the code. DPD has chosen to submit this method because we believe the code needs a viable alternative to the currently unworkable requirements. It should be noted that this proposal is independent of the Study Group proposals, and will work regardless of the outcome of the proposals from the Study Group.

Specific changes:

The new text in Section 909.21.1 clarifies between which two points the pressure differential gets measured. In general, the intent of the code is to keep smoke out of the hoistway, so the pressure should be measured between the elevator hoistway and the elevator landing/lobby. However, the first exception allows the pressure to be measured between the hoistway and sleeping or dwelling units in residential buildings, since they are highly compartmented. In addition, the fire source is most likely to be in the dwelling or sleeping unit, and providing positive pressure in the corridor/hallway outside the units (via leakage through the elevator hoistway doors) will help reduce the smoke migrating from the affected unit. The second exception allows the pressure to be measured between the hoistway and the space on the outside the smoke barrier that forms the lobby.

The third exception is the key to this proposal, in that it requires the 0.10 inch water column pressure differential between the hoistway and the floor be met only on the 4 most critical floors—the floor of fire origin, the two floors immediately below, and one floor immediately above. For all other stories, the pressure differential is allowed to be measured between the hoistway and the outside of the building. The purpose of this requirement is to maintain a slightly positive pressure in the building relative to atmospheric, so as to lower the neutral pressure plane in the building, which then reduces the driving force of stack effect. This exception is intended to be permitted to be used in conjunction with Exceptions 1 and 2. The engineers who design this system begin by modeling one floor as the “notionalized” fire floor, and designing the system (fans, dampers, etc.) accordingly. Each floor is subsequently modeled as the notionalized fire floor, and the system is checked to make sure the maximum and minimum pressure differentials are met. (Note that actual models may not have to be run for each floor, if it is clear the worst case has been covered.) Ultimately, the system will need to be designed so it will correctly configure itself for a fire originating on any floor in the building.

New section 909.21.1.1 allows the use of the general building HVAC system to exhaust air to create/maintain the required pressure differential. It is to be noted that the requirements of the rest of Section 909.21, in particular, Section 909.21.10 regarding protection of equipment, would still apply to these components.

Cost Impact: This proposal will increase the cost of construction.

FS141-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.21.1.1-FS-SIU

FS142 – 12
909.21.3, Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

909.21.3 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same
fire-resistance rating as required for the elevator shaft enclosure.

> **Exception:** Ducts tested and *listed* for not less than 2-hour fire-resistance in accordance with ASTM E2816 are permitted.

Add new standard to Chapter 35 as follows:

ASTM
E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.

Reason: This proposal permits an additional exception to the requirement to install fire dampers in duct and air transfer openings through fire barriers provided the HVAC ducts are protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose. This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criteria provides an alternate to shaft enclosures for vertical ducts.

This principle of protecting HVAC ducts used as part of a smoke control system from the effects of fire exposure is also already contained in section 909.4.4 which requires that the design consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis must include all permutations of systems status, and the design shall consider the effects of the fire on the HVAC systems.

The ASTM test method achieves this by evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to other compartments separated by a fire resistance rated construction when the HVAC duct system is exposed to fire under one or more of the following conditions:

Condition A— Fire exposure from the outside of the horizontal HVAC duct system without openings,
Condition B— Fire exposure from the outside of the vertical HVAC duct system without openings,
Condition C— Fire exposure from the outside with hot gases entering the inside of the horizontal HVAC duct system with unprotected openings, and
Condition D— Fire exposure from the outside with hot gases entering the inside of the vertical HVAC duct system with unprotected openings.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment when subjected to the standard time-temperature curve of ASTM E119.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: FS58, Part V and FS 142 contain similar requirements for elevator hoistway pressurization. The committee needs to make its intent clear with respect to these provisions. A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS142-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.21.3-FS-CRIMI

FS143 – 12
909.21.4, 909.21.4.5 (New)

Proponent: Bill Ziegert, Smoke Guard, Inc representing self

Revise as follows:

909.21.4 Fan system. The fan system provided for the pressurization system shall be as required by Sections 909.21.4.1 through ~~909.21.4.4~~ 909.21.4.5.

909.21.4.5 Pressurization Air Temperature. The temperature of elevator shaft pressurization air shall comply with Section 2.7.9.2 of ASME A17.1.

Reason: This proposal clarifies that when the elevator shaft pressurization option is chosen in lieu of fully enclosed elevator lobbies when required by the code, that the pressurization air shall not negatively impact elevator equipment. The Elevator Code restricts that ambient air temperature in elevator machine rooms and control spaces to be within the range specified by the elevator manufacturer which is typically 40 – 105 degrees Fahrenheit.

With the advent of machine room less elevators, the control equipment is often with the elevator shaft. This requirement would insure that elevator shaft pressurization air is conditioned to the levels required by the elevator manufacturer. This is particularly important since pressurization systems will at times be running at the same time as elevator operation including both Pre – Phase 1 and during Phase 2 when the Fire Service may be using the elevator systems to move equipment and personnel and elevator reliability is particularly critical.

Cost Impact: In colder climates this may require conditioning systems to be added to the pressurization intake.

FS143-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.21.4.5 (NEW)-FS-ZIEGERT

FS144 – 12
1403.2, 1404.2

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C, American Iron and Steel Institute representing: American Iron and Steel Institute and the Metal Building Manufacturers Association (Jhumble@steel.org)

Revise as follows:

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant *exterior wall envelope*. The *exterior wall envelope* shall include flashing, as described in Section 1405.4. The *exterior wall envelope* shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a means for draining water that enters the wall assembly to the exterior, or by providing an *exterior wall covering* which acts as both a weather-resistant and *water-resistive barrier*. A ~~a~~ *water-resistive barrier* ~~behind the exterior veneer~~, as described in Section 1404.2, shall be provided behind the exterior veneer of a veneered *exterior wall envelope* ~~and a means for draining water that enters the assembly to the exterior~~. Protection against condensation in the *exterior wall* assembly shall be provided in accordance with Section 1405.3.

Exceptions: *(Portions of text remain unchanged)*

1404.2 Water-resistive barrier. A minimum of one layer of No.15 asphalt felt, complying with ASTM D 226 for Type 1 felt or other *approved* materials, shall be attached to the studs or sheathing of a veneered system, with flashing as described in Section 1405.4, in such a manner as to provide a continuous *water-resistive barrier* behind the *exterior wall* veneer.

Reason: This code change proposes to modify Section 1403.2 in two places. The intent is to resolve the confusion of metal wall systems versus veneered wall assemblies.

The intent of the modifications is to make clear the fundamental requirement for providing a means for draining water that enters a veneered or non-veneered wall assembly by moving this requirement to the preceding sentence that focuses on the prevention of accumulation of water within the wall assembly.

This modification also clarifies that the requirement for a water-resistive barrier is only applicable to a veneered system. We propose to allow those non-veneered systems to be exempted from the requirement for a water-resistive barrier as that is redundant. For example, the traditional non-veneered walls used for an engineered metal building utilize an exterior metal cladding attached to girts and a water-resistive barrier behind this exterior metal cladding is not required as the metal skin acts both as the weather-resistant barrier and water-resistive barrier. Another non-veneered example is the metal composite material system or insulated metal panel wall system which also serves in a similar capacity. The MCM and IMP systems constitute another type of metal cladding system where the edges of the panels are both interlocked and gasketed, thus acting as both a weather-resistant barrier and water-resistant barrier.

The remaining provisions of Section 1403.2 remain unchanged.

The change in Section 1404.2 is for clarification and coordination with the changes in Section 1403.2.

Cost Impact: No impact to the cost of construction is anticipated.

FS144-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.2-FS-HUMBLE

FS145 – 12
1403.2

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations (theresa.a.weston@usa.dupont.com)

Revise as follows:

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant *exterior wall envelope*. The *exterior wall envelope* shall include flashing, as described in Section 1405.4. The *exterior wall envelope* shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a *waterresistive barrier* behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. <u>In areas with an average annual rainfall exceeding 35 inches, walls shall have an average minimum drainage efficiency of 75 percent when tested in accordance the requirements of ASTM E 2273.</u> Protection against condensation in the *exterior wall* assembly shall be provided in accordance with Section 1405.3.

Exception: *(No change to current text)*

Reason: This proposal adds a method of measuring drainage to the requirement for a means of drainage for high rainfall areas. Drainage is an important component of managing water, especially under high rainfall/ exposure conditions, such as those in the Pacific Northwest (Portland, OR 43.5" avg, Seattle, WA 37.7" avg.). Drainage requirements, including the proposed requirement, have been included in the Oregon State Residential Code.

Cost Impact: The code change proposal will increase the cost of construction in locations with high rainfall.

FS145-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.2-FS-WESTON

FS146 – 12
1403.3.1 (New)

Proponent: Edward L. Keith, P.E., representing APA – The Engineered Wood Association. (ed.keith@apawood.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

1403.3 Structural. *Exterior walls*, and the associated openings, shall be designed and constructed to resist safely the superimposed loads required by Chapter 16.

1403.3.1 Structural capacity of an assembly. Where the exterior wall covering and the backing materials are designed to resist wind loads together as an assembly, the opaque exterior wall, including gable ends, shall be constructed as an assembly with required backing materials.

Reason: There are a number of wall constructions promoted today for use in exterior wall applications that use the code recognized assembly approach to resist wind loads normal (acting perpendicular) to the exterior walls. The assembly approach recognizes that in a properly assembled wall system, the applied wind loads are distributed to a number of different wall components. These components may include the exterior siding, sheathing and interior gypsum wall board finish. The performance of the wall system is dependent on each of the component members being properly installed and present during the wind event. The assembly systems can only resist the design wind load when this is the case as each component carries some part of the load. Loss of a single layer of the assembly can mean the failure of that portion of wall.

The code change is proposed to clarify that when such systems are used that they must be used on all areas of the exterior wall including the gable-end walls. Surveys of wind storm damage over the last few years have consistently shown that gable end walls are one of the most common areas where breaches in the building envelope occur, in many cases at wind speeds much lower than the code design wind speed. It often does not occur to the builder that the use of gypsum wall board is a requisite part of the wall assembly when cladding the gable-end walls. Lacking the interior gypsum wall board sheathing, the incomplete wall assemblies are often unable to resist the applied wind loads. This leads to the loss of the structural and weather resistance of the gable end. Loss of the gable-end cladding and the resulting pressurization of the building envelope often lead to more severe structural failures to the roof system, as well as water damage to the interior of the structure.

A recently published article in the Journal of Structural Engineering (August 5, 2011) entitled *Effects of Pressure Equalization on the Performance of Residential Wall Systems under Extreme Wind Loads*, by G. A. Kopp and E. Gavanski, is one of the most recent articles that recognize the susceptibility of structural wall assemblies to failure when any one of the assembly components is compromised or eliminated.

Cost Impact: The code change proposal will not increase the cost of construction.

FS146-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.3.1 (NEW)-FS-KEITH

FS147 – 12
1403.5

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations (theresa.a.weston@usa.dupont.com)

Revise as follows:

1403.5 Vertical and lateral flame propagation. Exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible water-resistive barrier shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

> **Exception:** Walls that contain less than 500 gm/m^2 combustible material and where the water-resistive barrier has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723.

Reason: Section 1403.5 (new in 2012) requires NFPA 285 testing for exterior walls containing a combustible water-resistive barrier. Since walls are required by Section 1402.3 to incorporate a water-resistive barrier and virtually all water-resistive barriers currently on the market are combustible, the introduction of this section into the code is requiring testing of all walls. This proposal exempts walls in which the only combustible material is a water-resistive barrier with low flame spread and low mass so that it will have an insignificant contribution to the total fuel load of the wall system.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: FS14 7 revised the provisions for flame propagation in noncombustible exterior walls. FS148 deletes these requirements. The committee needs to make its intent clear with respect to these provisions.

FS147-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.5-FS-WESTON

FS148 – 12
1403.5

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com); Henry Green, President, National Institute of Building Sciences, representing NIBS BETEC Committee (hgreen@nibs.org)

Delete without substitution:

~~**1403.5 Vertical and Lateral Flame Propagation.** Exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible water-resistive barrier shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.~~

Reason: There are materials that are available, tried and tested by long-term proven history of performance as weather barriers that are not able to meet the standards in this test. Section 1403.2 of the IBC requires weather-resistive barriers while Section 1403.5 requires them to be tested to a standard if they contain a combustible water resistive barrier that many materials that are traditionally used and have proven their value can't meet.

Section 2603.5 establishes requirements for protection and testing of combustible water resistive barriers that include foam plastic insulation, so Section 1403.5 is not necessary for those products. Given that 75% of construction litigation relates to water leakage suggests that this paragraph should be deleted or we are likely to face significant problems in the future with the failure of exterior water barriers.

Cost Impact: The change will reduce the cost of construction.

Analysis: FS14 7 revised the provisions for flame propagation in noncombustible exterior walls. FS148 deletes these requirements. The committee needs to make its intent clear with respect to these provisions.

FS148-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.5-FS-COLLINS-GREEN

FS149 – 12
1403.6 (New), Chapter 35

Proponent: Marcelo M. Hirschler, GBH International (gbhint@aol.com); Sean DeCrane, representing Cleveland Fire Department/International Association of Fire Fighters (rovloc93@aol.com)

Add new text as follows:

1403.6 Resistance to Radiant Heat. Exterior walls on buildings of Type V construction that are greater than 20 feet (6096 mm) in height above grade plane, contain combustible components and are not required to exhibit a fire resistance rating shall be tested in accordance with ASTM E2707 and demonstrate absence of flame penetration through the wall assembly at any time during the test and absence of evidence of glowing combustion on the interior surface of the assembly at the end of the test.

Exceptions:

1. Exterior walls that comply with NFPA 285.
2. Exterior walls that comply with FM 4880.
3. Exterior walls that comply with UL 1040.
4. Exterior walls that exhibit a 1 hour fire resistance rating if tested to ASTM E119 or UL 263.
5. The fire separation distance to the adjacent building is no less than 10 feet (3048 mm).

(Renumber subsequent sections)

Add new standard to Chapter 35 as follows:

ASTM
E2707 (2009), Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure.

Reason: The requirements for insulation of buildings of Type V construction are increasing to such an extent that there will be a significantly increased use of combustible insulation materials as part of exterior walls. If we believe that these buildings are not just "built to burn down" we need to consider protecting them from radiant heat generated by neighboring buildings.

ASTM E2707 was developed specifically for this purpose. It assesses whether the wall resists a radiant exposure of 150 kW for 10 minutes. The conditions of acceptance are not in the mandatory part of the standard but in section X1.2.10, which is a non mandatory appendix and are therefore needed in the code.

The exceptions are for walls that comply with a severe fire test (or have a fire resistance rating) already: they don't need to be retested. Note that NFPA 285, FM 4880 and UL 1040 are all severe fire tests that were specifically designed to assess the fire performance of exterior walls containing combustible materials.

If the walls have not been tested the separation distance must be increased to lower the risk of radiant heat ignition from the neighboring building.

Note that exterior walls for buildings of Type VB construction are not required to comply with a fire resistance rating in accordance with ASTM E119 or UL 263 (see Tables 601 and 602). Also, exterior walls for buildings of Type VA construction are permitted to be exempt from complying with a fire resistance rating if the building is sprinklered. The sprinklers will protect the interior of the building but will have no effect on the radiated heat released externally by the burning wall, which can then potentially affect neighboring buildings.

Cost Impact: Minimal

FS149-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.6 (NEW)-FS-DECRANE-HIRSCHLER

FS150 – 12
1403.6

Proponent: Philip Line, American Wood Council, representing American Wood Council

Revise as follows:

1403.6 Flood resistance. For buildings in flood hazard areas as established in Section 1612.3, *exterior walls* extending below the elevation required by Section 1612 shall be constructed with flood-damage-resistant materials. ~~Wood shall be pressure-preservative treated in accordance with AWPA U1 for the species, product and end use using a preservative *listed* in Section 4 of AWPA U1 or decay-resistant heartwood of redwood, black locust or cedar.~~

Reason: The specific requirement for preservative treated wood in *exterior walls* extending below the base flood elevation is deleted because wood products such as plywood sheathing, plywood panel siding and wall studs have been shown to be resistant to effects of flood exposure without aid of preservatives required elsewhere in the code for protection of wood from decay and termites.

Primary considerations for material performance and use in flood hazard areas are outlined in FEMA *TB2 Flood Damage Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas*. A flood damage resistant material is one that is "capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage". Evaluation consists of consideration of material performance following 72 hr immersion and presence of only limited damage requiring no more than cosmetic repair (e.g. cleaning, sanitizing, and resurfacing such as sanding, repair of joints, repainting). Research conducted by Oak Ridge National Laboratory and Tuskegee University (ORNL/TM-2005/34 Field Testing of Energy-Efficient Flood-Damage-Resistant Residential Envelope Systems Summary Report, June 2004) and field observations of material performance from actual floods were considerations in the update of FEMA TB2-2008. Within TB2, examples of wood that are not required to be preservative treated for flood damage resistance that may form a part of *exterior walls* include studs and Exterior and Marine Plywood used as wall sheathing. While preservative treated studs and preservative treated exterior plywood sheathing were not tested in the ORNL/Tuskegee study, it is not expected that presence of preservative treatment would improve the already acceptable performance of these materials.

Requirements for preservative treated wood for protection from decay and termites are addressed elsewhere in the code (see 2303.1.8, 2304.11 and Chapter 18) and will continue to be in effect including in flood hazard areas. These include required preservative treatment of: i) wood framing members, including wood sheathing, that rest on exterior foundation walls and are less than 8 inches from exposed earth, ii) wood framing members and furring strips attached directly to the interior of exterior masonry or concrete walls below grade, iii) sleepers and sills on a concrete or masonry slab that is in direct contact with earth, iv) wood siding where clearance is less than 6 inches from earth or less than 2 inches horizontal surfaces such as concrete porch or similar surface, and v) wood in contact with ground.

A similar requirement for preservative-treated wood along with reference to FEMA TB2 is in the 2012 IRC. A companion change to this proposal will be submitted to the IRC to make provisions of the IRC and IBC consistent.

FS150-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.6-FS-LINE

FS151 – 12
1404.2, Chapter 35

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations (theresa.a.weston@usa.dupont.com)

Revise as follows:

1404.2 Water-resistive barrier. A minimum of one layer of ~~No.15 asphalt felt~~ water-resistive barrier, complying with ASTM ~~D 226 for Type 1 felt~~ E 2556 or other *approved* materials, shall be attached to the studs or sheathing, with flashing as described in Section 1405.4, in such a manner as to provide a continuous *water-resistive barrier* behind the *exterior wall* veneer.

Add new standard to Chapter 35 as follows:

ASTM

E2556-10 Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

Reason: The proposal updates the water-resistive barrier reference to the most recent consensus standard. ASTM E2556 includes housewrap materials, building papers and felt, instead of just felt and therefore is more representative of the state of the industry. ASTM E2556 is consistent with the current ICC-ES acceptance criteria for water-resistive barriers (AC-38) and therefore should not limit the use of current WRBs.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2556-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS151-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.2-FS-WESTON

FS152 – 12
1404.2, 1405.4 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

Revise as follows:

1404.2 Water-resistive barrier. A water-resistive barrier material shall be ~~a minimum of one layer of~~ No.15 asphalt felt~~,~~ complying with ASTM D 226 for Type 1 felt, Grade D paper in accordance with Section 2510.6, or other *approved* materials and installations performance tested for water resistance and durability and determined to be at least equivalent to a typical installation of No. 15 asphalt felt over a continuous substrate. At a minimum, water resistance tests of the water-resistive barrier installation without cladding installed shall be conducted using ASTM E 331 with a minimum 15 minute test duration and a minimum 2.86 psf (137 Pa) pressure differential using minimum 4-foot (1.2 m) by 8-foot (2.4 m) wall specimens including at least one horizontal and one vertical joint with joints and attachments installed in the manner intended for end use~~, shall be attached to the studs or sheathing, with flashing as described in Section 1405.4, in such a manner as to provide a continuous~~ ~~*water-resistive barrier*~~ ~~behind the~~ ~~*exterior wall*~~ ~~veneer~~. Where water-resistive barriers are evaluated as part of a wall assembly with cladding installed, the water resistance performance testing provisions of Section 1403.2 exception 2 shall apply.

1405.4 Water-resistive barrier. Water-resistive barrier materials and flashing shall be installed in such a manner as to provide a continuous *water-resistive barrier* behind the exterior wall cladding. Where No. 15 asphalt felt complying with ASTM D226 for Type 1 felt is used as a water-resistive barrier material, a minimum of one layer shall be required with minimum 2-inch (51 mm) horizontal shingle-style lap joints and minimum 6-inch (152 mm) vertical lap joints. No. 15 asphalt felt and other approved membrane-type water-resistive barrier materials shall be attached to sheathing for backing or an approved water-resistive barrier sheathing installation shall be used.

(Renumber subsequent sections)

Reason: Current section 1404.2 includes installation requirements as well as material requirements while Section 1404 Materials is meant to apply to materials only. Installation requirements for exterior wall covering assembly components or materials are intended to be addressed in Section 1405. Therefore, this proposal moves installation requirements from Section 1404.2 to a new Section 1405.4, just ahead of existing section 1405.4 which deals with the closely associated requirements for flashing installation. Material requirements only are retained in Section 1404.2 and the performance requirement for “other approved materials” is clarified to ensure equivalency to No. 15 felt which defines the traditional benchmark for WRBs. Performance testing requirements for alternatives are clarified for the case when the WRB is tested without cladding installed. In addition, installation requirements for No. 15 felt and other membrane WRBs are strengthened in proposed Section 1405.4 by requiring installation over sheathing to ensure lap joints remain closed and wind pressure fluctuations do not create a “pumping effect” drawing air in and out of the wall cavity.

Cost Impact: The code change proposal will not increase the cost of construction.

FS152-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.2-FS-CRANDELL

FS153 – 12

202 (New), 1402.1, 1404.3 (New), 1405.5 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

Add new definition as follows:

SECTION 202
DEFINITIONS

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.

Revise as follows:

1402.1 Definitions. The following terms are defined in Chapter 2:

ADHERED MASONRY VENEER.
AIR BARRIER
ANCHORED MASONRY VENEER.
BACKING.
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS).
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE.
EXTERIOR WALL.
EXTERIOR WALL COVERING.
EXTERIOR WALL ENVELOPE.
FIBER-CEMENT SIDING.
HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL).
HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL) SYSTEM.
METAL COMPOSITE MATERIAL (MCM).
METAL COMPOSITE MATERIAL (MCM) SYSTEM.
POLYPROPYLENE SIDING.
PORCELAIN TILE.
VENEER.
VINYL SIDING.
WATER-RESISTIVE BARRIER.

1404.3 Air barriers. Air barrier materials shall comply with Section C402.4.1.2.1 of the *International Energy Conservation Code*. Air barrier wall assemblies shall comply with Section C402.4.1.2.2 of the *International Energy Conservation Code*.

(Renumber subsequent sections)

1405.5 Air barrier installation. Air barriers shall be provided and installed in exterior walls in accordance with Section C402.4.1.1 of the *International Energy Conservation Code* and the additional requirements of this section. An air barrier shall be provided in or by an exterior wall assembly. Where using air permeable cavity insulation in an exterior frame wall assembly, air barriers shall be provided on both the inside and outside face of the wall cavity. Where air-barriers are installed on the exterior side of an exterior wall, it shall be a sheathing material or placed on a sheathing material for backing.

(Renumber subsequent sections)

Reason: Air barriers should not just be a requirement for energy code compliance from the standpoint of controlling overall building air leakage. Air barriers also play an important role in controlling access of warm, moist air into building cavities where they can condensate on cold surfaces (exterior surface in cold climates or interior surface of cavity in warm/humid climates). In this regard, air barriers should be considered as important as vapor retarders which are addressed in current Section 1405.3 of the IBC. Air barriers also provide wall boundary conditions (interior and exterior surfaces) for air permeable cavity insulation products to ensure that they perform as intended and in a condition that is consistent with the basis of insulation material thermal property testing. Thus, it is important to include air barriers in the IBC to address their role in a manner that compliments the IECC. With the above purpose in mind, this proposal coordinates with and builds on information and requirements already found in the IECC. The definition is directly from the IECC.

Cost Impact: The code change proposal will not increase the cost of construction.

FS153-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.3 (NEW)-FS-CRANDELL

FS154 – 12
1404.4

Proponent: John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA) (jwoestman@kellencompany.com)

Revise as follows:

1404.4 Masonry. Exterior walls of masonry construction shall be designed and constructed in accordance with this section and Chapter 21. Masonry units, mortar and metal accessories used in anchored and adhered veneer shall meet the physical requirements of Chapter 21. The backing of anchored and adhered veneer shall be of concrete, masonry, steel framing or wood framing. <u>Insulation board meeting the applicable requirements of the code shall be permitted between the backing and the masonry veneer.</u>

Reason: Section 1404.4 could be interpreted as not allowing continuous insulation / insulation board to be placed in the wall system between the masonry veneer and the backing.

Cost Impact: None

FS154-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.4-FS-WOESTMAN

FS155 – 12
1404.5

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1404.5 Metal. Exterior walls constructed of cold-formed steel ~~construction~~, structural steel or aluminum~~lightweight metal alloys~~ shall be designed in accordance with Chapters 22 and 20, respectively.

Reason: These minor editorial modifications in this section correct the terminology related to cold-formed steel and aluminum to match that utilized in Chapter 22, Section 2210 and Chapter 20.

Cost Impact: No impact to the cost of construction is anticipated.

FS155-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.5-FS-MANLEY

FS156 – 12
1404.10, Chapter 35

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, Products in Fibre-reinforced Cement and self

Revise as follows:

1404.10 Fiber-cement siding. Fiber-cement siding shall conform to the requirements of ASTM C1186, Type A (or ISO 8336, Category A), and shall be so identified on labeling listing an *approved* quality control agency.

Add new standard to Chapter 35 as follows:

ISO
8336-2009 Fiber-Cement Flat Sheets – Product Specification and Test Methods

Reason: Performance requirements of ISO 8336, *Fibre-cement flat sheets – Product specification and test methods*, have been harmonized with the performance requirements of ASTM C1186. Fiber-cement siding producers in Mexico, Central and South America, Europe, Asia, Australia and New Zealand currently manufacture and test their fiber-cement siding products for compliance with ISO 8336 (see attached). Members of International Standards Organization Technical Committee 77, *Product in Fiber-reinforced Cement,* are working to have their respective country's codes, where applicable, revised to include the harmonized standard. The inclusion of this Standard in the IBC will eliminate a barrier to trade by permitting manufacturers worldwide to demonstrate compliance with product performance requirements specific to the United States without incurring the added expense of additional test report documentation.

Cost Impact: The code change proposal will not increase the cost of construction because the recognition of the alternative compliance Standard can reduce test report documentation requirements thereby reducing costs to the product manufacturer and reduces a barrier to trade.

Analysis: A review of the standard proposed for inclusion in the code, ISO 8336-2009, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS156-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.10-FS-MULDER

FS157 – 12
1404.13 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

Add new text as follows:

1404.13 Foam Plastic Insulation. Foam plastic insulation used in exterior wall covering assemblies shall comply with Section 2603.

Reason: Foam plastic insulation is commonly included as a component in exterior wall covering assemblies for energy code compliance and is included in the current definition of exterior wall coverings. Therefore, it is appropriate to include in Chapter14 reference to applicable material requirements in Chapter 26.

Cost Impact: The code change proposal will not increase the cost of construction.

FS157-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.13 (NEW)-FS-CRANDELL

FS158 – 12
1405.1

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

Revise as follows:

1405.1 General. *Exterior wall coverings* shall be designed and constructed in accordance with the applicable provisions of this section. Where foam plastic insulation is included in an exterior wall covering assembly, the installation shall comply with the applicable provisions of Chapter 26 in addition to the requirements of this section.

Reason: Insulation is appropriately included in the definition of exterior wall coverings. When foam plastic insulation is included as a component in an exterior wall covering assembly, additional requirements for the foam sheathing as well as the exterior wall covering assembly and also the wall system apply and are found in Chapter 26. This proposal makes a proper linkage to those requirements in Chapter 26.

Cost Impact: The code change proposal will not increase the cost of construction.

FS158-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.1-FS-CRANDELL

FS159 – 12
1405.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1405.3 Vapor retarders. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. <u>Box sills.</u>
5. <u>Where other approved means to avoid condensation in unventilated framed wall, floor, roof and ceiling cavities are provided.</u>

Reason: There are situations in which a vapor retarder is not a viable installation. In the situation of open box sills, commonly located above a basement drop ceiling, access is limited, and thus the ability to properly install a vapor retarder in a box sill is also limited. To require vapor retarder for such spaces is not practical.

Additionally, there are a multitude of wall products and wall configurations which may provide a means to avoid condensation in unventilated framed wall, floor, roof and ceiling cavities, however, the current language does not allow for recognition of them. The intent of the proposed exception is to allow for design flexibility.

Please note that the submitter would accept the inclusion of one of the proposed exceptions without the inclusion of the other.

Cost Impact: The code change proposal will not increase the cost of construction.

FS159-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.3-FS-DAHMEN

FS160 – 12
1405.3, 1405.3.1, Table 1405.3.1, 1405.3.2

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

Revise as follows:

1405.3 Vapor retarders. Vapor retarders as described in Section 1405.3.3 shall be provided in accordance with Sections 1405.3.1 and 1405.3.2, or an approved design using accepted engineering practice for hygrothermal analysis.

1405.3.1 Class I and II Vapor Retarders. Class I or II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. Conditions where Class III vapor retarders are required in Section 1405.3.2.

1405.3.~~1~~2 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 1405.3.1 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with perm rating of less than 1 perm is applied in accordance with Table 1405.3.1 on the exterior side of the frame wall.

TABLE 1405.3.1
CLASS III VAPOR RETARDERS

(Portions of table not shown remain unchanged)

a. Spray foam with a minimum density of 2 lbs/ft^3 applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

~~1405.3.2~~ 1405.3.3 Material vapor retarder class. The *vapor retarder class* shall be based on the manufacturer's certified testing or a tested assembly. The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, nonperforated aluminum foil with a perm rating of less than or equal to 0.1.
Class II: Kraft-faced fiberglass batts or paint with a perm rating greater than 0.1 and less than or equal to 1.0.
Class III: Latex or enamel paint with a perm rating of greater than 1 and less than or equal to 10.

Reason: Provisions are strengthened and clarified to better promote seasonal drying of walls and avoid a “double vapor barrier” condition in combination with a “warm wall” design using insulating sheathing in cold climates. Provision is also added to clarify that low perm vapor retarders on interior side of walls shall not be used in the warmer climate zones as indicated to avoid a reversed vapor retarder. In essence the code says well what “ought” to be done, but doesn’t clearly prohibit what “ought not” be done.

Cost Impact: The code change proposal will not increase the cost of construction.

FS160-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.3-FS-CRANDELL

FS161 – 12
1405.4, Chapter 35

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations (theresa.a.weston@usa.dupont.com)

Revise as follows:

1405.4 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of *exterior wall* assemblies, *exterior wall* intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting *trim*. When self-adhered membranes are used as flashing, those self-adhered flashings shall comply with AAMA 711. When fluid applied membranes are used as flashing, those fluid applied membrane flashings shall comply with AAMA 714.

Add new standards to Chapter 35 as follows:

AAMA 711-07 Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products

AAMA 714-11 Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings

Reason: This proposal will add new requirements to the code. Self-adhered membranes and fluid –applied membranes comprise growing segments of the flashing material market, but no material property or performance requirements for these materials are currently included in the code. Industry developed standards, AAMA 711 and AAMA 714, were developed to insure that these types of material meet minimum performance specifications. This proposal incorporates these industry standards by reference into the code. The properties and quality of flashing materials are crucial to successful implementation of the water management in wall systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, AAMA 711-07 and AAMA 714-11, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS161-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.4-FS-WESTON

FS162 – 12
Table 1405.2, 1405.7, 1405.8

Proponent: John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA) (jwoestman@kellencompany.com)

Revise as follows:

TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERINGS

COVERING TYPE	MINIMUM THICKNESS (inches)
~~Prec~~Cast stone facing[e]	0.625

(Portions of table not shown remain unchanged)

For SI: 1 inch = 25.4 mm.
a. Wood siding of thicknesses less than 0.5 inch shall be placed over sheathing that conforms to Section 2304.6.
b. Exclusive of texture.
c. As measured at the bottom of decorative grooves.
d. 16 ounces per square foot for cold-rolled copper and lead-coated copper, 12 ounces per square foot for copper shingles, high-yield copper and leadcoated high-yield copper.
e. Includes scratch coat, setting bed, and ~~pre~~cast stone.

1405.7 Stone veneer. Anchored ~~S~~stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

(No change to items 1 through 3)

1405.8 Slab-type veneer. Anchored ~~S~~slab-type veneer units not exceeding 2 inches (51 mm) in thickness shall be anchored directly to masonry, concrete or stud construction For veneer units of marble, travertine, granite or other stone units of slab form ties of corrosion-resistant dowels in drilled holes shall be located in the middle third of the edge of the units, spaced a maximum of 24 inches (610 mm) apart around the periphery of each unit with not less than four ties per veneer unit. Units shall not exceed 20 square feet (1.9 m2) in area. If the dowels are not tight fitting, the holes shall be drilled not more than 0.063 inch (1.6 mm) larger in diameter than the dowel, with the hole countersunk to a diameter and depth equal to twice the diameter of the dowel in order to provide a tight-fitting key of cement mortar at the dowel locations when the mortar in the joint has set. Veneer ties shall be corrosion-resistant metal capable of resisting, in tension or compression, a force equal to two times the weight of the attached veneer. If made of sheet metal, veneer ties shall be not smaller in area than 0.0336 by 1 inch (0.853 by 25 mm) or, if made of wire, not smaller in diameter than 0.1483-inch (3.76 mm) wire.

Reason: While working on several code change proposals to clarify requirements for adhered masonry veneer, these minor revision opportunities were identified.

The revision of Table 1405.2 is proposed as "Cast stone" is defined in the IBC as precast of Portland cement concrete and used as a trim, veneer, or facing." Precast stone" is not defined in the IBC.

The other revisions provide consistency in language for these types of anchored veneer, and to clarify these are anchored veneer requirements (and not adhered veneer requirements).

Cost Impact: None

FS162-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1405.2-FS-WOESTMAN

FS163 – 12
1405.8

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1405.8 Slab-type veneer. Slab-type veneer units not exceeding 2 inches (51 mm) in thickness shall be anchored directly to masonry, concrete or ~~stud~~ light-frame construction. For veneer units of marble, travertine, granite or other stone units of slab form ties of corrosion-resistant dowels in drilled holes shall be located in the middle third of the edge of the units, spaced a maximum of 24 inches (610 mm) apart around the periphery of each unit with not less than four ties per veneer unit. Units shall not exceed 20 square feet (1.9 m2) in area. If the dowels are not tight fitting, the holes shall be drilled not more than 0.063 inch (1.6 mm) larger in diameter than the dowel, with the hole countersunk to a diameter and depth equal to twice the diameter of the dowel in order to provide a tight-fitting key of cement mortar at the dowel locations when the mortar in the joint has set. Veneer ties shall be corrosion-resistant metal capable of resisting, in tension or compression, a force equal to two times the weight of the attached veneer. If made of sheet metal, veneer ties shall be not smaller in area than 0.0336 by 1 inch (0.853 by 25 mm) or, if made of wire, not smaller in diameter than 0.1483-inch (3.76 mm) wire.

Reason: This minor editorial change corrects terminology to match the defined term found in IBC, Section 202, *Light-Frame Construction.*

Cost Impact: No impact to the cost of construction is anticipated.

FS163-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.8-FS-MANLEY

FS164 – 12
1405.11

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1405.11 Metal veneers. Veneers of metal shall be fabricated from *approved* corrosion-resistant materials or shall be protected front and back with porcelain enamel, or otherwise be treated to render the metal resistant to corrosion. Such veneers shall not be less than 0.0149-inch (0.378 mm) nominal thickness sheet steel mounted on wood or metal furring strips or approved sheathing on ~~the wood~~ light-frame construction.

Reason: In this application, the use of sheathing should not be limited solely to wood construction. Rather, by utilizing the more general term of *light-frame construction*, which is defined in IBC Section 202, it allows approved sheathing to be used on both wood and cold-formed steel framing.

Cost Impact: No impact to the cost of construction is anticipated.

FS164-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.11-FS-MANLEY

FS165 – 12
1405.11.1

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1405.11.1 Attachment. Exterior metal veneer shall be securely attached to the supporting masonry or framing members with corrosion-resistant fastenings, metal ties or by other *approved* devices or methods. The spacing of the fastenings or ties shall not exceed 24 inches (610 mm) either vertically or horizontally, but where units exceed 4 square feet (0.4 m2) in area there shall be not less than four attachments per unit. The metal attachments shall have a cross-sectional area not less than provided by W 1.7 wire. Such attachments and their supports shall be ~~capable of resisting a horizontal force in accordance with~~ designed and constructed to resist the wind loads as specified in Section 1609 for components and cladding~~, but in no case less than 20 psf (0.958 kg/m2)~~.

Reason: As a result of the publication of the 2010 edition of ASCE 7, the 2012 edition of the IBC made significant changes to the wind load provisions in Section 1609, including the conversion from nominal design wind speeds to ultimate design wind speeds, and the creation of wind speed maps that reflect a structure's particular Risk Category. (See Section 1609.3.) Unfortunately, in this process, this minimum pressure for the attachment of metal veneers in Section 1405.11.1 was not updated. This leaves one of two options available: 1. the minimum wind pressure could be corrected to reflect the ASCE 7-10 basis, if it is still needed; or, 2. the minimum pressure could be eliminated in deference to the minimum design wind pressure specified in ASCE 7.

Rather than continue to complicate the code with a specific minimum pressure that requires continued maintenance, we recommend that it be eliminated and, that the section defer to the ASCE 7 minimum net design wind pressure for components and cladding, which is set at 16 psf in ASCE 7-10, Section 30.2.2. (See also 1609.6.3 for the minimum specified in the simplified method.) ASCE 7-10, Chapter 30 is adopted in Section 1609.

Cost Impact: No impact to the cost of construction is anticipated.

FS165-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.11.1-FS-MANLEY

FS166 – 12
1405.11.3

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1405.11.3 Backup. Masonry backup shall not be required for metal veneer unless required by~~except as is necessary to meet~~ the fire resistance requirements of this code.

Reason: This editorial modification simplifies the code language.

Cost Impact: No impact to the cost of construction is anticipated.

FS166-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.11.3-FS-MANLEY

FS167 – 12
1405.14.1

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1405.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the *water-resistive barrier* requirements in Section 1403. Siding and accessories shall be installed in accordance with *approved* manufacturer's instructions. Unless otherwise specified in the *approved* manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and 1/8-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least 3/4 inch (19 mm). <u>For cold-formed steel light-frame construction, corrosion-resistant fasteners shall be used and shall penetrate the cold-formed steel framing at least three exposed threads.</u> Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

Reason: The section should include guidance on fastener requirements for cold-formed steel light-frame construction similar to those specified in IBC Section 1405.16. In adding the language from Section 1405.16, a change was made from “all weather screws” to “corrosion-resistant fasteners,” which is the more appropriate and more commonly used term. Additionally, the language was corrected from “three full threads” to “three exposed threads.” This matches language used in AISI S200, Section D1.3. Also, it avoids confusion on what a “full thread” is; as long as three threads can be seen from any side of the screw, it’s sufficient. A separate, coordinating proposal for Section 1405.16 corrects the language there.

Cost Impact: No impact to the cost of construction is anticipated.

FS167-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.14.1-FS-MANLEY

FS168 – 12

1405.14.1, 1405.14.2 (New), 1405.14.2.1 (New), 1405.14.2.2 (New), 1405.14.2.3 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz); Matt Dobson, Vinyl Siding Institute (mdobson@vinylsiding.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

1405.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Vinyl siding installed over foam plastic sheathing shall comply with Section 1405.14.2. Siding shall be applied to conform with the *water-resistive barrier* requirements in Section 1403. Siding and accessories shall be installed in accordance with *approved* manufacturer's instructions. Unless otherwise specified in the *approved* manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313- inch (7.9 mm) head diameter and 1/8-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least 3/4 inch (19 mm). Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

1405.14.2 Foam Plastic Sheathing. Vinyl siding used with foam plastic sheathing shall be installed in accordance with Section 1405.14.2.1, 1405.14.2.2, or 1405.14.2.3.

Exceptions:

1. Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing, or other *approved* backing capable of independently resisting the design wind pressure, the requirements of Section 1405.14.1 shall apply.
2. Where the foam plastic sheathing is capable of independently resisting the design wind pressure, including its connections to the wall structure, the requirements of Section 1405.14.1 shall apply.

1405.14.2.1 Basic wind speed not exceeding 90 miles per hour (V_{asd}) and Exposure Category B. Where the basic wind speed does not exceed 90 miles per hour (40 m/s) (V_{asd}), the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 11/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, 16 inches on center. The foam plastic sheathing shall be minimum 1/2-inch-thick (12.7 mm) (nominal) extruded polystyrene per ASTM C 578, 1/2-inch-thick (12.7 mm) (nominal) polyisocyanurate per ASTM C 1289, or 1-inch-thick (25 mm) (nominal) expanded polystyrene per ASTM C 578.

1405.14.2.2 Basic wind speed exceeding 90 miles per hour (V_{asd}) or Exposure Categories C and D. Where the basic wind speed exceeds 90 miles per hour (40 m/s) (V_{asd}) or the Exposure Category is C or D, or all conditions of Section 1405.14.2.1 are not met, the design pressure rating for the assembly shall meet or exceed the components and cladding wind load determine in accordance with Section 1609. The design wind pressure rating of the vinyl siding for installation over backing capable of independently resisting the design wind pressure as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:

1. For wall assemblies with foam plastic sheathing on the exterior side and gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.

2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.

1405.14.2.3 Manufacturer specification. Where the vinyl siding manufacturer's product specifications provide an *approved* design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

Reason: Vinyl siding is commonly installed over foam plastic insulation (sheathing) for energy code compliance. Provisions are needed to ensure appropriate installation of vinyl siding over foam sheathing to resist wind load. These provisions are consistent with provisions included in the 2009 and 2012 IRC. The provisions are based on testing of various foam sheathing materials and vinyl siding materials with a range of wind pressure ratings to ensure broad applicability and adequate performance. A summary of the research and testing can be found at www.foamsheathing.org, including accredited test laboratory test reports. Additional confirmatory testing is on-going at the IBHS full-scale wind tunnel with initial results supporting the proposed adjustment of vinyl siding wind pressure ratings. The adjustments to vinyl siding wind pressure ratings for use of foam sheathing include an increase in safety factor from 1.5 to 2.0 as well as an increase in the net wind load acting on the vinyl siding to account for the combined wind pressure acting across the foam sheathing and vinyl siding layers of the wall. These provisions will ensure compliance with wind load provisions in Section 1609 of the IBC as applicable to exterior walls in Chapter 14 of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

FS168-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.14.1-FS-CRANDELL

FS169 – 12
1405.16

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1405.16 Fiber-cement siding. Fiber-cement siding complying with Section 1404.10 shall be permitted on exterior walls of Type I, II, III, IV and V construction for wind pressure resistance or wind speed exposures as indicated by the manufacturer's listing and *label* and *approved* installation instructions. Where specified, the siding shall be installed over sheathing or materials *listed* in Section 2304.6 and shall be installed to conform to the *water-resistive barrier* requirements in Section 1403. Siding and accessories shall be installed in accordance with *approved* manufacturer's instructions. Unless otherwise specified in the *approved* manufacturer's instructions, nails used to fasten the siding to wood studs shall be corrosion-resistant round head smooth shank and shall be long enough to penetrate the studs at least 1 inch (25 mm). For cold-formed steel light-frame construction ~~metal framing~~, ~~all-weather screws~~ corrosion-resistant fasteners shall be used and shall penetrate the the cold-formed steel framing ~~metal~~ ~~framing~~ at least three exposed ~~full~~ threads.

Reason: The editorial modifications correct the terminology to reflect what is adopted in Section 2211. A change was made from "all weather screws" to "corrosion-resistant fasteners," which is the more appropriate and more commonly used term. Additionally, the language was corrected from "three full threads" to "three exposed threads." This matches language used in AISI S200, Section D1.3. Also, it avoids confusion on what a "full thread" is; as long as three threads can be seen from any side of the screw, it's sufficient.

Cost Impact: No impact to the cost of construction is anticipated.

FS169-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.16-FS-MANLEY

FS170 – 12
1405.16.1, Chapter 35

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, Products in Fibre-reinforced Cement and self

Revise as follows:

1405.16.1 Panel siding. Fiber-cement panels shall comply with the requirements of ASTM C1186, Type A, minimum Grade II (or ISO 8336, Category A, minimum Class 2). Panels shall be installed with the long dimension either parallel or perpendicular to framing. Vertical and horizontal joints shall occur over framing members and shall be ~~sealed~~ protected with *approved* caulking, or ~~covered~~ with battens, or flashing, or be vertical or horizontal shiplap, or otherwise ~~shall be~~ designed to comply with Section 1403.2. Panel siding shall be installed with fasteners in accordance with the *approved* manufacturer's instructions.

Add new standard to Chapter 35 as follows:

ISO
8336-2009 Fiber-Cement Flat Sheets – Product Specification and Test Methods

Reason: Performance requirements of ISO 8336, *Fibre-cement flat sheets – Product specification and test methods*, have been harmonized with the performance requirements of ASTM C1186, *Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets*. Fiber-cement siding producers in Mexico, Central and South America, Europe, Asia, Australia and New Zealand currently manufacture and test their fiber-cement siding products for compliance with ISO 8336. The inclusion of this Standard reference in the IBC will permit manufacturers worldwide to demonstrate product compliance to IBC requirements. The addition of a reference to ISO 8336 in the Code removes a barrier to trade. Additional editorial changes are proposed to clarify the nature of the required vertical and/or horizontal joint protection to include reference to *approved* caulking and the recognition of both vertical or horizontal shiplap joints as a means of protecting the joints as is also common with wood panel siding.

Cost Impact: The code change proposal will not increase the cost of construction because the product is already recognized for use in the Code. Reference to compliance with this alternative standard, an International Standard requiring the same performance as the ASTM Standard, will reduce barriers to trade by allowing foreign products complying with ISO 8336, Category A, minimum Class 2, market access to the United States without the need for additional product compliance documentation.

Analysis: A review of the standard proposed for inclusion in the code, ISO 8336-2009, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS170-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.16.1-FS-MULDER

FS171 – 12
1405.16.2, Chapter 35

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, Products in Fibre-reinforced Cement and self

Revise as follows:

1405.16.2 Lap siding. Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C1186, Type A, minimum Grade II (or ISO 8336, Category A, minimum Class 2). Lap siding shall be lapped a minimum 1¼ inches (32 mm) and lap siding not having tongue-and-groove end joints shall have the ends sealed with *approved* caulking, or covered with an H-section joint cover, or located over a strip of flashing or otherwise shall be designed to comply with Section 1403.2. Lap siding courses shall be installed with fastener heads exposed or concealed in accordance with the *approved* manufacturer's instructions.

Add new standard to Chapter 35 as follows:

ISO

8336-2009	Fiber-Cement Flat Sheets – Product Specification and Test Methods

Reason: Performance requirements of ISO 8336, *Fibre-cement flat sheets – Product specification and test methods*, have been harmonized with the performance requirements of ASTM C1186, *Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets*. Fiber-cement siding producers in Mexico, Central and South America, Europe, Asia, Australia and New Zealand currently manufacture and test their fiber-cement siding products for compliance with ISO 8336. The inclusion of this Standard reference in the IBC will permit manufacturers worldwide to demonstrate product compliance to IBC requirements. The addition of a reference to ISO 8336 in the Code removes a barrier to trade. Additional editorial changes are proposed to clarify the nature of the required vertical joint protection and to include reference to *approved* caulking.

Cost Impact: The code change proposal will not increase the cost of construction because the product is already recognized for use in the Code. Reference to compliance with this alternative standard, an International Standard requiring the same performance as the ASTM Standard, will reduce barriers to trade by allowing foreign products complying with ISO 8336, Category A, minimum Class 2, market access to the United States without the need for additional product compliance documentation.

Analysis: A review of the standard proposed for inclusion in the code, ISO 8336-2009, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS171-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1405.16.2-FS-MULDER

FS172 – 12
1406.2.1.1, 2603.5.7

Proponent: Michael D. Fischer, Kellen Company, representing self (mfischer@kellencompany.com)

Revise as follows:

1406.2.1.1 Ignition resistance. Where permitted by Section 1406.2.1, combustible exterior wall coverings shall be tested in accordance with NFPA 268.

Exceptions:

1. Wood or wood-based products.
2. Other combustible materials covered with an exterior weather covering, other than vinyl sidings, ~~listed~~ included in and complying with the thickness requirements of ~~in~~ Table 1405.2.
3. Aluminum having a minimum thickness of 0.019 inch (0.48 mm).

Revise as follows:

2603.5.7 Ignition. *Exterior walls* shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed.

Exception: Assemblies protected on the outside with one of the following:

1. A thermal barrier complying with Section 2603.4.
2. A minimum 1 inch (25 mm) thickness of concrete or masonry.
3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8 inch (9.5 mm).
4. Metal-faced panels having minimum 0.019-inch thick (0.48 mm) aluminum or 0.016-inch-thick (0.41 mm) corrosion-resistant steel outer facings.
5. A minimum 7/8-inch (22.2 mm) thickness of stucco complying with Section 2510.
6. Exterior weather coverings, other than vinyl sidings, meeting the minimum thickness requirements of Table 1405.2.

Reason: This proposal does two things: first, it clarifies that the exception for exterior weather coverings in 1406.2.1.1 must meet the minimum thickness requirements of Table 1405.2, and second it closes a gap in the code between 1406.2.1.1 and 2603.5.7. NFPA 268 is not required for certain combustible exterior wall coverings per 1406.2.1.1; the proposal makes that clear in 2603.5.7 in order to add consistency and clarity to the intended application of NFPA 268.

Cost Impact: The proposal will not increase the cost of construction.

FS172-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1406.2.1.1-FS-FISCHER

FS173 – 12
1407.1.1

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Centria (jbeitel@haifire.com)

Revise as follows:

1407.1 General. The provisions of this section shall govern the materials, construction and quality of metal composite materials (MCM) for use as *exterior wall coverings* in addition to other applicable requirements of Chapters 14 and 16.

1407.1.1 **<u>Core Material</u>** **~~Plastic core~~.** <u>MCMs that contain a core material of foam plastic insulation as defined in Section 2602.1 shall comply with the requirements of Chapter 26.</u>
~~The plastic core of the MCM shall not contain foam plastic insulation as defined in Section 2602.1.~~

Reason: MCMs contain a solid plastic core and are regulated by Section 1407. A factory-manufactured panel consisting of steel skins and a foam plastic insulation core is regulated by Chapter 26. However, some Code officials and others have interpreted the existing Section 1407.1.1 such that the factory-manufactured panel consisting of steel skins and foam plastic insulation core is not allowed by the Code and thus cannot be used.

The proposed wording clarifies the intent of the Code and will hopefully avoid future misinterpretations.

Cost Impact: The Code change proposal will not increase the cost of construction.

FS173-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1407.1.1-FS-BEITEL

FS174 – 12
1407.10.2

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

1407.10.2 Thermal barriers. MCM shall be separated from the interior of a building by an approved thermal barrier consisting of 1/2 -inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. <u>If the integrity fire test is conducted in accordance with NFPA 286, the acceptance criteria shall be as indicated in section 803.1.2 of this code.</u>

Reason: There has been some discussion about allowing as thermal barriers materials that cause flashover when tested to NFPA 286. That should not be allowed and this language will ensure that thermal barriers protect against flashover in the fire area.

Note that the integrity fire test of NFPA 275 can be conducted in accordance with NFPA 286, UL 1040, UL 1715 or FM 4880. In UL 1040, UL 1715 and FM 4880 pass/fail criteria are included and flashover is not permitted. NFPA 286 does not contain pass/fail criteria and the code must have its own acceptance criteria.

Cost Impact: None

FS174-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1407.10.2-FS-HIRSCHLER

FS175 – 12
1409.10.2

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

1409.10.2 Thermal barriers. HPL shall be separated from the interior of a building by an approved thermal barrier consisting of 1/2-inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. If the integrity fire test is conducted in accordance with NFPA 286, the acceptance criteria shall be as indicated in section 803.1.2 of this code. ~~equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure in accordance with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for not less than 15 minutes based on a test conducted in accordance with UL 1715.~~

Reason: This section describes the criteria for a thermal barrier for HPL materials (as contained for MCM materials in 1407.10.2 and for foam plastics in 2603.4) and the language should be similar to the language in those sections. An additional sentence is recommended, as also proposed for section 1407.10.2 and 2603.4) to prevent the use of a thermal barrier that permits flashover.

There has been some discussion about allowing as thermal barriers materials that cause flashover when tested to NFPA 286. That should not be allowed and this language will ensure that thermal barriers protect against flashover in the fire area.

Note that the integrity fire test of NFPA 275 can be conducted in accordance with NFPA 286, UL 1040, UL 1715 or FM 4880. In UL 1040, UL 1715 and FM 4880 pass/fail criteria are included and flashover is not permitted. NFPA 286 does not contain pass/fail criteria and the code must have its own acceptance criteria.

The language in 1407.10.2 and 2603.4 (with the proposed addition) is shown below.

1407.10.2 Thermal barriers. MCM shall be separated from the interior of a building by an approved thermal barrier consisting of 1/2 -inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. If the integrity fire test is conducted in accordance with NFPA 286, the acceptance criteria shall be as indicated in section 803.1.2 of this code.

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.10, foam plastic shall be separated from the interior of a building by an approved thermal barrier of ½-inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. If the integrity fire test is conducted in accordance with NFPA 286, the acceptance criteria shall be as indicated in section 803.1.2 of this code. Combustible concealed spaces shall comply with Section 718.

Cost Impact: None

FS175-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1409.10.2-FS-HIRSCHLER

FS176 – 12
1409.11.3 (New), 1409.11.4 (New)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Trespa North America, Ltd (jbeitel@haifire.com)

Add new text as follows:

1409.11.3 Installations up to 75 feet in height (Option 1). HPL shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1409.11.3.1 through 1409.11.3.5.

> **Exception:** Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be exempt from the height limitation.

1409.11.3.1 Prohibited occupancies. HPL shall not be permitted on buildings classified as Group A-1, A-2, H, I-2 or I-3 occupancies.

1409.11.3.2 Nonfire-resistance-rated exterior walls. HPL shall not be permitted on exterior walls required to have a *fire-resistance rating* by other provisions of this code.

1409.11.3.3 Specifications. HPL shall be required to comply with all of the following:

1. HPL shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.
2. HPL shall conform to one of the following combustibility classifications when tested in accordance with ASTM D 635:

Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.

Class CC2: Materials that have a burning rate of 2½ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.

1409.11.3.4 Area limitation and separation. The maximum area of a single HPL panel and the minimum vertical and horizontal separation requirements for HPL panels shall be as provided for in Table 1409.11.3.4. The maximum percentage of exterior wall area of any story covered with HPL panels shall not exceed that indicated in Table 1409.11.3.4 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.

> **Exception:** In buildings provided with flame barriers complying with Section 705.8.5 and extending 30 inches (760 mm) beyond the exterior wall in the plane of the floor, a vertical separation shall not be required at the floor other than that provided by the vertical thickness of the flame barrier.

1409.11.3.5 Automatic sprinkler system increases. Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum percentage area of exterior wall of any story covered with HPL panels and the maximum square footage of a single area of HPL panels in Table 1409.11.3.4 shall be increased 100 percent. The area of HPL panels shall not exceed 50 percent of the exterior wall area of any story or the area permitted by Section 704.8 for unprotected openings, whichever is smaller.

1409.11.4 Installations up to 75 feet in height (Option 2). HPL shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1409.11.4.1 through 1409.11.4.4.

Exception: Buildings equipped throughout with an automatic sprinkler system in accordance with ection 903.3.1.1 shall be exempt from the height limitation.

1409.11.4.1 Minimum fire separation distance. HPL shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).

Exception: Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6096 mm).

1409.11.4.2 Specifications. HPL shall be required to comply with all of the following:

1. HPL shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.
2. HPL shall conform to one of the following combustibility classifications when tested in accordance with ASTM D 635:

Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.

Class CC2: Materials that have a burning rate of 2 ½ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.

1409.11.4.3 Area and size limitations. The aggregate area of HPL panels shall not exceed 25 percent of the area of any exterior wall face of the story on which it is installed. The area of a single HPL panel installed above the first story above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single HPL panel shall not exceed 4 feet (1219 mm).

Exception: Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum aggregate area of HPL panels shall be increased to 50 percent of the exterior wall face of the story on which it is installed and there shall not be a limit on the maximum dimension or area of a single HPL panel.

1409.11.4.4 Vertical separations. Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the exterior wall or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate HPL panels located on the exterior walls at one story intervals.

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

TABLE 1409.11.3.4
AREA LIMITATION AND SEPARATION REQUIREMENTS FOR HPL PANELS

Fire Separation Distance (feet)	Combustibility Class of HPL	Maximum Percentage Area of Exterior Wall Covered with HPL Panels	Maximum Single Area of HPL Panels (square feet)	Minimum Separation of HPL Panels (feet)	
				Vertical	Horizontal
Less than 6	–	Not Permitted	Not Permitted	–	–
6 or more but less than 11	CC1	10	50	8	4
	CC2	Not Permitted	Not Permitted	–	–
11 or more but less than or equal to 30	CC1	25	90	6	4
	CC2	15	70	8	4
More than 30	CC1	50	Not Permitted	3[a]	0
	CC2	50	100	6[a]	3

For SI: 1 foot; 304.8 mm, 1 square foot; 0.0929 m^2.
a. For reductions in the minimum vertical separation, see Section 1409.11.3.4.

Reason: This code change proposal provides for additional alternate conditions under which HPL and HPL systems can be installed on buildings greater than 50 feet in height. Two conditions are allowed which are based on the allowable use of light-transmitting plastics in the exterior walls of buildings in accordance with Section 2607 Light-transmitting Plastic Wall Panels, Section 2608 Light-transmitting Plastic Glazing and Section 1407.11.3 for MCMs.

The two Chapter 26 sections have been in the International Building Code (IBC) since its inception and were basically contained in all three of the legacy model building codes for many years prior to the development of the IBC. The MCM section was added during the last Code cycle. Thus, the concept of limited amounts of these types of materials on exterior walls has a long history of successful fire performance under the previous legacy codes, as well as under the IBC.

We believe that if exposed light-transmitting plastics and MCMs can be used on the exterior walls of buildings under the provisions indicated in those sections, it is reasonable to expect that HPLs should perform as well or better. It should be noted that the HPL meet all the requirements necessary to be an approved plastic which is also the requirement for light-transmitting plastics. Additionally, in a manner similar to MCMs the HPLs must meet an even more stringent burning limitation than light-transmitting plastics since HPLs are required to be tested in accordance with ASTM E84 or UL 723 to demonstrate a flame spread index not greater than 75 and a smoke-developed index not greater than 450.

Based on this, we request the Committee approve this code change proposal to allow for additional but limited applications of HPLs on buildings greater than 50 feet in height.

Cost Impact: This code change proposal will not increase the cost of construction.

FS176-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1409.11.3 (NEW)-FS-BEITEL

FS177 – 12

809 (New), 1410 (New), 2103.15 (New)

Proponent: John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA) (jwoestman@kellencompany.com)

Add new text as follows:

SECTION 809
INTERIOR ADHERED MASONRY VENEER

809.1 Adhered masonry veneer. Interior adhered masonry veneer shall comply with the applicable requirements in Section 809 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

809.2 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m2) and shall be installed in accordance with Section 809 and the requirements of Section 1410 applicable to interior adhered masonry veneer. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit vertical deflection to L/600 of the span of the supporting members.

Revise as follows:

~~**1405.10 Adhered masonry veneer.** Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.~~

~~**1405.10.1 Exterior adhered masonry veneer.** Exterior adhered masonry veneer shall be installed in accordance with Section 1405.10 and in accordance with the manufacturer's instructions.~~

~~**1405.10.1.1 Water-resistive barriers.** Water-resistive barriers shall be installed as required in Section 2510.6.~~

~~**1405.10.1.2 Flashing at foundation.** A corrosion resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gauge galvanized or plastic with a minimum vertical attachment flange of 31/2 inches (89 mm) shall be installed extend a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1405.4. The water-resistive barrier shall lap over the exterior of the attachment flange of the screed or flashing.~~

~~**1405.10.1.3 Clearances.** On exterior stud walls, adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth, or a minimum of 2 inches (51 mm) above paved areas, or a minimum of 1/2 inch (12 mm) above exterior walking surfaces which are supported by the same foundation that supports the exterior wall.~~

~~**1405.10.2 Exterior adhered masonry veneers—porcelain tile**. Adhered units shall not exceed 5/8 inch (15.8 mm) thickness and a maximum of 24 inches (610 mm) in any face dimension nor more than 3 square feet (0.28 m2) in total face area and shall not weigh more than 9 pounds psf (0.43 kN/m2). Porcelain tile shall be adhered to an approved backing system.~~

~~**1405.10.3 Interior adhered masonry veneers.** Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m2) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to L/600 of the span of the supporting members.~~

SECTION 1410
EXTERIOR ADHERED MASONRY VENEER

1410.1 General. The provisions of this section shall govern the materials, construction, and quality of adhered masonry veneer for use as exterior wall coverings in addition to the applicable requirements of Chapters 14, 16, 21, and 25. Interior adhered masonry veneer shall comply with Section 809.

1410.2 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be installed in accordance with Section 1410 and in accordance with the manufacturer's instructions and shall comply with the applicable requirements in Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5..

1410.2.1 Flashing. Flashing shall comply with the applicable requirements of Section 1405.4 and the following.

1410.2.1.1 Flashing at foundation. A corrosion resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gauge galvanized or plastic with a minimum vertical attachment flange of 31/2 inches (89 mm) shall be installed extend a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1405.4. The water-resistive barrier shall lap over the exterior of the attachment flange of the screed or flashing.

1410.2.2 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section 2510.6.

1410.2.3 Clearances. On exterior stud walls, adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth, or a minimum of 2 inches (51 mm) above paved areas, or a minimum of 1/2 inch (12 mm) above exterior walking surfaces which are supported by the same foundation that supports the exterior wall.

1410.2.4 Adhered masonry veneer installed with lath and mortar. Exterior adhered masonry veneer installed with lath and mortar shall comply with the following.

1410.2.4.1 Lathing. Lathing shall comply with the requirements of Section 2510.

1410.2.4.2 Scratch Coat. A nominal ½" thick layer of mortar complying with the material requirements of Sections 2103.15 and 2512.2 shall be applied encapsulating the lathing. The surface of this mortar shall be scored horizontally resulting in a scratch coat.

1410.2.4.3 Adhering veneer. The masonry veneer units shall be adhered to the mortar scratch coat with a nominal ½" thick setting bed of mortar complying with Sections 2103.15 and 2512.2 applied to create a full setting bed for the back of the masonry veneer units. The masonry veneer units shall be worked into the setting bed resulting in a nominal 3/8" setting bed after the masonry veneer units are applied.

1410.2.5 Adhered masonry veneer applied directly to masonry and concrete. Adhered masonry veneer applied directly to masonry or concrete shall comply with the applicable requirements of Section 1410 and with the requirements of Section 2510.7 or Section 1410.2.4.

1410.2.6 Cold weather construction. Cold weather construction of adhered masonry veneer shall comply with the requirements of Sections 2104.3 and 2512.4.

1410.2.7 Hot weather construction. Hot weather construction of adhered masonry veneer shall comply with the requirements of Section 2104.4.

1410.3 Exterior adhered masonry veneers—porcelain tile. Adhered units shall not exceed 5/8 inch (15.8 mm) thickness and a maximum of 24 inches (610 mm) in any face dimension nor more than 3 square feet (0.28 m2) in total face area and shall not weigh more than 9 pounds psf (0.43 kN/m2). Porcelain tile shall be adhered to an approved backing system.

Add new text as follows:

2103.15 Mortar for adhered masonry veneer. Mortar for use with adhered masonry veneer shall conform to ASTM C270 for Type N or Type S, or shall comply with ANSI A118.4 for latex-modified Portland cement mortar.

Reason: This proposal seeks to clarify requirements for adhered masonry veneer (AMV).

This proposal moves the requirements for exterior AMV to a new section at the end of Chapter 14, Exterior Walls, and then expands on the requirements for exterior AMV. The requirements for interior AMV are moved to a new section at the end of Chapter 8, Interior Finishes (as AMV installed in the interior is essentially an interior finish).

For ease of presenting the new sections at the ends of Chapter 8 and Chapter 14, the original text in Section 1405.10 is shown as deleted. However, the current technical requirements of the IBC in 1405.10 are included in the two new sections for interior AMV (proposed Section 809) and exterior AMV (proposed Section 1410)

AMV is similar in some ways to masonry, and also similar in some ways to cement plaster. But AMV is also dissimilar to both of these well-known materials. With this proposal, we have attempted to reference existing code requirements where appropriate. Also, where we believe appropriate, we have presented specific requirements for AMV.

Regarding the mortar used for AMV systems, we're proposing a new section at the end of Section 2103 clearly defining the requirements for mortars used with AMV.

Cost Impact: None

FS177-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

809 (NEW)-FS-WOESTMAN

FS178 – 12
2603.1

Proponent: Philip J. Smith PE, representing FM Approvals (phillip.smith@fmapprovals.com)

Revise as follows:

2603.3 Surface-burning characteristics. Unless otherwise indicated in this section, foam plastic insulation and foam plastic cores of manufactured assemblies shall have a flame spread index of not more than 75 and a smoke-developed index of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723. Loose fill-type foam plastic insulation shall be tested as board stock for the flame spread and smoke-developed indexes.

Exceptions:

1. Smoke-developed index for interior *trim* as provided for in Section 2604.2.
2. In cold storage buildings, ice plants, food plants, food processing rooms and similar areas, foam plastic insulation where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the building is equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1. The approved *automatic sprinkler system* shall be provided in both the room and that part of the building in which the room is located.
3. Foam plastic insulation that is a part of a Class A, B or C roof-covering assembly provided the assembly with the foam plastic insulation satisfactorily passes ~~FM 4450~~ <u>NFPA 276</u> or UL 1256. The smoke-developed index shall not be limited for roof applications.
4. Foam plastic insulation greater than 4 inches (102 mm) in thickness shall have a maximum flame spread index of 75 and a smoke-developed index of 450 where tested at a minimum thickness of 4 inches (102 mm), provided the end use is approved in accordance with Section 2603.10 using the thickness and density intended for use.
5. Flame spread and smoke-developed indexes for foam plastic interior signs in *covered and open mall buildings* provided the signs comply with Section 402.6.4.

2603.4.1.5 Roofing. Foam plastic insulation under a roof assembly or roof covering that is installed in accordance with the code and the manufacturer's instructions shall be separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material. A thermal barrier is not required for foam plastic insulation that is a part of a Class A, B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes ~~FM 4450~~ <u>NFPA 276</u> or UL 1256.

1508.1 General. The use of above-deck thermal insulation shall be permitted provided such insulation is covered with an *approved* roof covering and passes the tests of ~~FM 4450~~ <u>NFPA 276</u> or UL 1256 when tested as an assembly.

Add new standard to Chapter 35 as follows:

<u>NFPA 276-11, Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components.</u>

Reason: NFPA 276 is a consensus internal fire test identical to the FM Approvals roof deck calorimeter test contained in FM 4450.

Cost Impact: The code change proposal will not increase the cost of construction.

FS178-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.1-FS-SMITH-2603.4.1.5-FS-SMITH-1508.1-S-SMITH

FS179 – 12
2603.3

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

2603.3 Surface-burning characteristics. Unless otherwise indicated in this section, foam plastic insulation and foam plastic cores of manufactured assemblies shall have a flame spread index of not more than 75 and a smoke-developed index of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723. Loose fill-type foam plastic insulation shall be tested as board stock for the flame spread and smoke-developed indexes.

Exceptions:

1. Smoke-developed index for interior *trim* as provided for in Section 2604.2.
2. In cold storage buildings, ice plants, food plants, food processing rooms and similar areas, foam plastic insulation where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the building is equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1. The approved *automatic sprinkler system* shall be provided in both the room and that part of the building in which the room is located.
3. Foam plastic insulation that is a part of a Class A, B or C roof-covering assembly provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256. ~~The smoke-developed index shall not be limited for roof applications.~~
4. Foam plastic insulation greater than 4 inches (102 mm) in thickness shall have a maximum flame spread index of 75 and a smoke-developed index of 450 where tested at a minimum thickness of 4 inches (102 mm), provided the end use is approved in accordance with Section 2603.10 using the thickness and density intended for use.
5. Flame spread and smoke-developed indexes for foam plastic interior signs in *covered and open mall buildings* provided the signs comply with Section 402.6.4.

Reason: Fires in roofing materials can occur during installation or maintenance of roofing, during the normal course of operations, or during maintenance and installation of building equipment. While ASTM E108 and UL 790 are a means of evaluating fire spread, they do not measure smoke production. In this case, smoke development ratings for roofing insulations and coverings are inappropriately exempted in 2603.3 Exception #3, and in 2603.6.

Both the IBC and the IFC identify in Section 101.3 that, in part, that the purpose of the Codes is to provide protection from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations. Although roofing materials are installed on the exterior of a building, the smoke from burning roof insulations can be a hazard to both firefighters and the environment. Air intakes are often installed through the roofing. In the event of a fire on the roof, smoke will be drawn back into the building through these intakes. Similarly, occupants of adjacent buildings and neighborhoods can also be affected by smoke emanating from combustible roof insulations. The waiver of the smoke developed requirements for roof insulations does not apply to any insulation other than foam plastic. This is not only inconsistent, but also not in keeping with the objectives of the Code, as identified in Chapter 1.

Emissions from fires in roofing materials have a serious impact on the environment. Not only are the combustion gases toxic at the site of the fire, but during a fire, very large quantities of particulates are also released into the environment. The particles consist among others of soot, tar, unburned materials, and inorganic debris. It should also be acknowledged that rooftop Occupancies are becoming increasingly popular. The existing provisions for rooftop structures in Chapter 15 are largely prescriptive and do not envision facilities such as restaurant seating, gardens, or performances on rooftops.

Even when a fire is contained within the building, sufficient heat can be generated through a metal roof deck to cause smoldering combustion and smoke release. While a smoke developed index of 450 is consistent with other sections of the IBC for foamed plastics. Several foam plastic insulation products have direct-to-steel-deck approvals from both FM and UL. FM approval for Class 1 roof systems based on passing FM 4450 and UL 1256. Both of these tests are specifically referenced in the IBC. The International Building Code (IBC) already waives the requirements for a thermal barrier for foam plastic roof insulation used in roof deck construction that complies with FM 4450 or UL 1256. Some minimum smoke developed rating should be maintained.

Cost Impact: This proposal does not increase the cost of construction.

FS179-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.3-FS-CRIMI

FS180 – 12
2603.4

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing self (wkoffel@koffel.com)

Revise as follows:

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.10, foam plastic shall be separated from the interior of a building by an approved thermal barrier of ½- inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. <u>Penetrations of the thermal barrier shall be protected to maintain the integrity of the thermal barrier.</u> Combustible concealed spaces shall comply with Section 718.

Reason: It is not uncommon to find penetrations of a thermal barrier. NFPA 275 does not include any provisions for the testing of penetrations. Therefore, one could interpret the Code to say that penetrations are not permitted. Unfortunately, no current test protocol specifically addresses penetrations of thermal barriers. Therefore, the language proposed is performance oriented and requires the registered design professional to document to the satisfaction of the building official (through the construction document process) how such penetrations are being protected.

Cost Impact: None

FS180-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.4-FS-KOFFEL

FS181 – 12
2603.4

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.10, foam plastic shall be separated from the interior of a building by an approved thermal barrier of ½- inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. <u>If the integrity fire test is conducted in accordance with NFPA 286, the acceptance criteria shall be as indicated in section 803.1.2 of this code.</u> Combustible concealed spaces shall comply with Section 718.

Reason: There has been some discussion about allowing as thermal barriers materials that cause flashover when tested to NFPA 286. That should not be allowed and this language will ensure that thermal barriers protect against flashover in the fire area.

Note that the integrity fire test of NFPA 275 can be conducted in accordance with NFPA 286, UL 1040, UL 1715 or FM 4880. In UL 1040, UL 1715 and FM 4880 pass/fail criteria are included and flashover is not permitted. NFPA 286 does not contain pass/fail criteria and the code must have its own acceptance criteria.

Cost Impact: None

FS181-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.4-FS-HIRSCHLER

FS182 – 12
2603.4.1.5

Proponent: Mike Ennis, representing SPRI Inc. (m.ennis@mac.com)

Delete and substitute as follows:

~~**2603.4.1.5 Roofing.** Foam plastic insulation under a roof assembly or roof covering that is installed in accordance with the code and the manufacturer's instructions shall be separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material. A thermal barrier is not required for foam plastic insulation that is a part of a Class A, B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.~~

2603.4.1.5 Roofing. The foam plastic insulation is a part of a Class A, B or C roof-covering assembly that is installed in accordance with the code and the manufacturer's instructions and is either constructed as described in 1 or tested as described in 2:

1. The roof assembly is separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material.
2. The assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.

Reason: The proposed wording is intended to clarify exceptions for the use of a thermal barrier to separate foam plastic insulation from the interior of the building. The current wording does not clearly convey that there are two exceptions for the use of a thermal barrier. One is a prescriptive construction technique; the other describes specific testing requirements.

Cost Impact: This code change proposal will not increase the cost of construction.

FS182-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.4.1.5-S-Ennis

FS183 – 12
2603.4.1.6

Proponent: Rick Thornberry, P.E. representing the Cellulose Insulation Manufacturers Association (CIMA)

Revise as follows:

2603.4.1.6 Attics and crawl spaces. Within an attic or crawl space where entry is made only for service of utilities, foam plastic insulation shall be protected against ignition by 11/2-inch-thick (38 mm) mineral fiber insulation; 1/4-inch-thick (6.4 mm) wood structural panel, particleboard or hardboard; 3/8-inch (9.5 mm) gypsum wallboard, corrosion-resistant steel having a base metal thickness of 0.016 inch (0.4 mm)<u>; 1 ½-inch-thick (38 mm) cellulose insulation in attic spaces only;</u> or other approved material installed in such a manner that the foam plastic insulation is not exposed. The protective covering shall be consistent with the requirements for the type of construction.

Reason: The effect of this code change proposal is to make Section 2603.4.1.6 in the IBC consistent with Sections R316.5.3 and R316.5.4 in the IRC.

During the 2009/2010 code development cycle for the 2012 IRC, we submitted Code Change RB62-09/10 which was approved as modified to add the 1 ½ inch thick cellulose insulation as a new Item 3.7 to the list of ignition barrier materials. The list of ignition barrier materials in Section 2603.4.1.6 is virtually identical to the list of those materials in Section R316.5.3 with the exception of the 1 ½ inch thick cellulose insulation we are proposing to add.

The Reason submitted for Code Change RB62-09/10 is reproduced below:

We are proposing the use of 1-1/2 inch thick cellulose loose-fill insulation as another acceptable material for use as an ignition barrier to satisfy the requirements of R314.5.3 for the protection of foam plastic insulation in attics as an alternate to the thermal barrier required by Section 314.4. We are basing this proposal on the equivalent performance to that of Item No. 1 of this section which allows 1-1/2 inch thick mineral fiber insulation that by definition includes both mineral wool and glass fiber. Presently, cellulose insulation is recognized as being equivalent to mineral fiber insulation for the purpose of providing an additional 15 minutes of protection to a fire-resistance rated wall assembly utilizing wood stud construction as specified in Table 721.6.2(5) of the 2009 International Building Code (IBC).

Furthermore, when the Cellulose Insulation Manufacturers Association (CIMA) conducted the full scale fire tests to validate the comparable performance of cellulose insulation in achieving a one-hour fire-resistance rating for wood stud wall assemblies faced with various thicknesses of gypsum wallboard, they also measured the heat transfer through the cellulose insulation within the wall cavity to determine its resistance to the movement of heat through the assembly during the ASTM E119 fire test exposure. The test data indicated that approximately 1-1/2 inches of cellulose insulation was capable of limiting the temperature increase to an average maximum temperature of 250°F for a period of 15 minutes which is the same performance specified for a thermal barrier in Section R314.4.

Therefore, we believe that this proposal to include 1-1/2 inch thick cellulose loose-fill insulation as another material acceptable for an ignition barrier is appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

FS183-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.4.1.6-FS-THORNBERRY

FS184 – 12
2603.4.1.8

Proponent: Jeff Inks, Window and Door Manufacturers Association, representing the National Architectural Door Council (jinks@wdma.com)

Revise as follows:

2603.4.1.8 Exterior doors in buildings of Group R-2 or R-3. In occupancies classified as Group R-2 or R-3, foam-filled exterior entrance doors to individual *dwelling units* that do not require a fire-resistance rating shall be faced with aluminum, steel, fiberglass, wood or other approved materials.

Reason: The language in this section has remained unchanged since at least the 2000 IBC. However, use of non-rated insulated side-hinged exterior doors with facing materials other than wood is commonplace without resulting in any compromise in fire safety. They should be expressly provided for in this section rather than require special approval.

Cost Impact: This proposal will not increase the cost of construction.

FS184-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.4.1.8-FS-INKS

FS185 – 12
2603.4.1.13

Proponent: Michael D. Fischer, Kellen Company, representing self (mfischer@kellencompany.com)

Revise as follows:

2603.4.1.13 Type V construction. Foam plastic spray applied to a sill plate~~,~~ ~~and~~ joist header and rim joist in ~~of~~ Type V construction is subject to all of the following:

1. The maximum thickness of the foam plastic shall be $3^1/_4$ inches (82.6 mm).
2. The density of the foam plastic shall be in the range of 1.5 to 2.0 pcf (24 to 32 kg/m^3).
3. The foam plastic shall have a flame spread index of 25 or less and an accompanying smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723.

Reason: The current text in the 2012 IBC was revised to add new language for floors in 2603.4.1.13, but the charging paragraph was not modified to include floor joists in the list of framing members. The proposal closes the gap in the code by including rim and/or band joists with sill plates and headers, and ensures that the prescriptive requirements also apply to those components.

Cost Impact: The proposal will not increase the cost of construction.

FS185-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.4.1.13-FS-FISCHER

FS186 – 12
2603.5, 2603.5.1 (New)

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

2603.5 Exterior walls of buildings <u>of Type I, II, III or IV construction</u> of any height. *Exterior walls* of buildings of Type I, II, III or IV construction of any height shall comply with Sections 2603.5.1 through 2603.5.7. *Exterior walls* of cold storage buildings required to be constructed of noncombustible materials, where the building is more than one *story* in height, shall also comply with the provisions of Sections 2603.5.1 through 2603.5.7.

> <u>**Exception:** Walls constructed of concrete or masonry where the foam plastic insulation is covered on each face by a minimum of 1-inch (25 mm) thickness of masonry or concrete.</u>

<u>**2603.5.1 Exterior walls of buildings**</u> <u>**of Type V construction**</u> *Exterior walls* of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4.

(Renumber subsequent sections)

Reason: The purpose of this code change is to reinstate the exception that was contained in Section 2602.5.2.2 of the 1997 Uniform Building Code (UBC) that exempted masonry and concrete exterior walls containing foam plastic insulation from the requirements of that section where the foam plastic insulation is covered by a minimum of 1-inch thickness of masonry or concrete. Based on research of the ICC code merging process, it appears that this exception was inadvertently omitted when the three legacy model building codes were originally merged into the First Working Draft of the IBC.

Section 2602.5.2.2 of the 1997 UBC was titled "Buildings of Any Height." It contained requirements for regulating the use of foam plastic insulation in the exterior walls of buildings where the exterior walls were required to be of noncombustible construction. These requirements are very similar to the requirements that were in Section 2603.5 of the 2000 IBC, as well as the current requirements contained in Section 2603.5 of the 2012 IBC. The proposed wording for this new Exception, based on the 1997 UBC, is the same wording used in IBC Section 2603.4.1.1 Masonry or Concrete Construction that allows the omission of the thermal barrier that is otherwise required to protect foam plastic insulation from the interior of the building. And it is similar to Item 2 in IBC Section 2603.5.7 Ignition that exempts exterior wall assemblies containing foam plastic insulation from being tested in accordance with NFPA 268 to determine ignition resistance to an exterior radiant heat source where the assembly is protected on the exterior with a minimum 1-inch thickness of concrete or masonry.

In a review of the legacy codes and development of the IBC there does not appear to be any technical reason justifying why this Exception was not included or should not be reinstated, nor are we aware of any adverse fire experience that precludes its application.

Cost Impact: The code change will not increase the cost of construction.

FS186-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.5-FS-THOMPSON

FS187 – 12
2603.5

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com); Henry Green, President, National Institute of Building Sciences, representing NIBS BETEC Committee (hgreen@nibs.org)

Revise as follows:

2603.5 Foam plastic insulation in exterior walls of buildings ~~of any height~~. Exterior walls of buildings ~~of Type I, II, III or IV construction of any height~~ including foam plastic insulation shall comply with Sections 2603.5.1 through 2603.5.~~7~~8.

2603.5.1 Exterior walls of Cold Storage Buildings. Exterior walls of cold storage buildings required by Section 503.1 to be constructed of noncombustible materials, where the building is more than one story in height, shall ~~also~~ comply with the provisions of Sections 2603.5.1 through 2603.5.~~7~~8.

2603.5.2 Exterior walls of Type V Construction. Exterior walls of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4.

2603.5.3 Buildings of Type I, II, III or IV Construction. Foam plastic insulation in exterior walls of buildings of Type I, II, III or IV construction shall comply with Section 2603.5.3.1, 2603.5.3.2, 2603.5.3 or 2603.5.4.

2603.5.3.1 One-story buildings complying with Section 2603.4.1.4.

2603.5.3.2 Building shall be sprinklered throughout in accordance with Section 903.3.1.1 or 903.3.1.2.

2603.5.3.3 The exterior walls shall be fireblocked per Section 718.2.6.

2603.5.3.4 The exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

~~**2603.5.1 Fire-resistance-rated walls.** Where the wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E 119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.~~

~~**2603.5.2**~~ **2603.5.4 Thermal barrier.** Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4, unless special approval is obtained on the basis of Section 2603.10.

> **Exception:** One-story buildings complying with Section 2603.4.1.4.

~~**2603.5.3**~~ **2603.5.5 Potential heat.** The potential heat of foam plastic insulation in any portion of the wall or panel shall not exceed the potential heat expressed in Btu per square feet (mJ/m2) of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.5.
The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (mJ/m2).

> **Exception:** One-story buildings complying with Section 2603.4.1.4.

~~**2603.5.4**~~ **2603.5.6 Flame spread and smoke-developed indexes.** Foam plastic insulation, exterior coatings and facings shall be tested separately in the thickness intended for use, but not to exceed 4 inches (102 mm), and shall each have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723.

Exception: Prefabricated or factory-manufactured panels having minimum 0.020-inch (0.51 mm) aluminum facings and a total thickness of 1/4 inch (6.4 mm) or less are permitted to be tested as an assembly where the foam plastic core is not exposed in the course of construction.

~~**2603.5.5 Vertical and lateral fire propagation.** The exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.~~

~~**Exception:** One-story buildings complying with Section 2603.4.1.4.~~

(Renumber subsequent sections)

Reason: In 1978, the U.S. Department of Energy (DOE) initiated a national program plan to address building enclosure systems. This program evolved into one of the National Institute of Building Science's first councils, the Building Enclosure Technology and Environment Council (BETEC). Today, DOE and more than 125 corporate and individual members support BETEC. An elected Board of Direction guides the Council. Government agency and association personnel, design and construction professionals, researchers and academics serve on BETEC committees and working groups, propose and review research, and organize symposia and publications.

Currently, Section 2603.5 requires all foam plastic exterior insulation materials to conform to the limits of NFPA 285. This test replicates the response of materials to a fire extending through an exterior window of a building. The code does not differentiate as to whether there is a potential for such a fire to occur in a building. Flashover fires which would cause the flame to break out of the building will not occur in a building that has a fully operational sprinkler system. Similar provisions in the code for other materials that are combustible and may lead to vertical and lateral spread of fire are required to provide fireblocking. In recreating Section 2603.5 we have incorporated various options to the use of this testing to address the risk of fire spreading on the exterior wall of a building where foam plastic insulation is found.

2603.5 The existing section includes three separate criteria, none of which has anything to do with height except for the provisions for cold storage buildings that only applies when they are over one story in height, so the title of the section is incorrect. In addition, to avoid additional confusion this code change breaks the section down into its various parts.

New 2603.5.1 The requirement for combustible or noncombustible walls is based on the construction type allowed in Section 503.1. The use of the term "also" implies there are other requirements that are not clearly spelled out.

New 2603.5.3 This is a new section that reflects the requirements for the use of combustible materials on the exterior of a building. The maximum height of an unsprinklered building is 55 feet to the occupied floor per Section 903.2.11.3. Current requirements for protection of combustible wood veneer materials on the exterior of a building are limited in Section 1405.5 to 40 feet in height. Fireblocking is required in Section 718.2.6 for concealed spaces on the exterior of a building.

2603.5.1 This existing section in the code is redundant with Section 703 of the IBC which requires all fire resistance rated walls to conform with ASTM E119 or UL 263. It isn't necessary to state everywhere in the code that if a wall is required to be fire resistance rated that it must pass these tests.

Cost Impact: The change will reduce the cost of construction.

FS187-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.5-FS-COLLINS-GREEN

FS188 – 12
2603.6

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

2603.6 Roofing. Foam plastic insulation meeting the requirements of Sections 2603.2, 2603.3 and 2603.4 shall be permitted as part of a roof-covering assembly, provided the assembly with the foam plastic insulation is a Class A, B or C roofing assembly where tested in accordance with ASTM E 108 or UL 790, and conforms to the smoke-developed requirements of Chapter 8.

Reason: Fires in roofing materials can occur during installation or maintenance of roofing, during the normal course of operations, or during maintenance and installation of building equipment. While ASTM E108 and UL 790 are a means of evaluating fire spread, they do not measure smoke production. In this case, smoke development ratings for roofing insulations and coverings are inappropriately exempted in 2603.3 Exception #3, and in 2603.6.

Both the IBC and the IFC identify in Section 101.3 that, in part, that the purpose of the Codes is to provide protection from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations. Although roofing materials are installed on the exterior of a building, the smoke from burning roof insulations can be a hazard to both firefighters and the environment. Air intakes are often installed through the roofing. In the event of a fire on the roof, smoke will be drawn back into the building through these intakes. Similarly, occupants of adjacent buildings and neighborhoods can also be affected by smoke emanating from combustible roof insulations. The waiver of the smoke developed requirements for roof insulations does not apply to any insulation other than foam plastic. This is not only inconsistent, but also not in keeping with the objectives of the Code, as identified in Chapter 1.

Emissions from fires in roofing materials have a serious impact on the environment. Not only are the combustion gases toxic at the site of the fire, but during a fire, very large quantities of particulates are also released into the environment. The particles consist among others of soot, tar, unburned materials, and inorganic debris. It should also be acknowledged that rooftop Occupancies are becoming increasingly popular. The existing provisions for rooftop structures in Chapter 15 are largely prescriptive and do not envision facilities such as restaurant seating, gardens, or performances on rooftops.

Even when a fire is contained within the building, sufficient heat can be generated through a metal roof deck to cause smoldering combustion and smoke release. While a smoke developed index of 450 is consistent with other sections of the IBC for foamed plastics. Several foam plastic insulation products have direct-to-steel-deck approvals from both FM and UL. FM approval for Class 1 roof systems based on passing FM 4450 and UL 1256. Both of these tests are specifically referenced in the IBC. The International Building Code (IBC) already waives the requirements for a thermal barrier for foam plastic roof insulation used in roof deck construction that complies with FM 4450 or UL 1256. Some minimum smoke developed rating should be maintained.

Cost Impact: This proposal should not increase the cost of construction.

FS188-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.6-FS-CRIMI

FS189 – 12
2603.7

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Delete and substitute as follows:

~~**2603.7 Interior finish in plenums.** Foam plastic insulation used as interior wall or ceiling finish in plenums shall comply with one or more of the following:~~

1. ~~The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~
2. ~~The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 when tested in accordance with NFPA 286.~~
3. ~~The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

2603.7 Foam plastic insulation used as interior finish or interior trim in plenums. Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of Sections 2603.7.1, 2603.7.2 and 2607.1.3.

2603.7.1 Separation required. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

2603.7.2 Approval. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 when tested in accordance with NFPA 286. The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10.

2603.7.3 Covering. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

(Renumber subsequent sections)

~~**2603.8 Interior trim in plenums.** Foam plastic insulation used as interior trim in plenums shall comply with the requirements of Section 2603.7.~~

Reason: Section 602.2.1.5 of the IMC has identical requirements to those of sections 2603.7 and 2603.8 of the IBC (see IMC text below). Section 603.1, item 2, of the IBC states (exception 25) that materials exposed within plenums should comply with the IMC. Therefore it is best if section 2603.7 of the IBC is simply extracted from the IMC.

Note that the IBC and IMC text both reference section 2603.10 of the IBC but that this section will be renumbered as 2603.9 if the proposal is accepted.

M602.2.1.5 Foam plastic insulation. Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of Sections 602.2.1.5.1, 602.2.1.5.2 and 602.2.1.5.3.

M602.2.1.5.1 Separation required. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the *International Building Code* and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

M602.2.1.5.2 Approval. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the *International Building Code* when tested in accordance with NFPA 286.
The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the *International Building Code*.

M602.2.1.5.3 Covering. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

Cost Impact: None

Analysis statement: If this proposal is approved for inclusion in the 2015 IBC, future maintenance of Section 2603.7 by the Mechanical Code Committee will be considered by the International Code Correlation Committee.

FS189-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.7-FS-HIRSCHLER

FS190 – 12
2603.10, 2603.10.1

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing The Extruded Polystyrene Foam Association (jbeitel@haifire.com)

Revise as follows:

2603.10 Special approval. Foam plastic shall not be required to comply with the requirements of Sections 2603.4, 2603.6, 2603.7 and ~~through~~ 2603.8 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.2), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall also conform to the flame spread and smoke developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

~~**2603.10.1 Exterior walls.** Testing based on Section 2603.10 shall not be used to eliminate any component of the construction of an exterior wall assembly when that component was included in the construction that has met the requirements of Section 2603.5.5.~~

Reason: This proposal prevents using a room/corner fire test to eliminate the requirements of 2603.5. A room corner test cannot definitively determine the vertical and lateral fire propagation characteristics of an exterior wall assembly and should not be used to eliminate the need for the appropriate test namely NFPA 285. Additionally, with the proposed change, Section 2603.10.1 is no longer needed.

Cost Impact: This code change proposal will not increase the cost of construction.

FS190-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.10-FS-BEITEL

FS191 – 12
2603.10, 2603.10.2 (New)

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

2603.10 Special approval. Foam plastic shall not be required to comply with the requirements of Sections 2603.4 through 2603.8 where specifically approved based on testing in accordance with large-scale tests such as, but not limited to, NFPA 286, ~~(~~with the acceptance criteria of Section 803.2~~), FM 4880, UL 1040 or UL 1715~~. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall also conform to the flame spread and smoke developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

2603.10.1 Exterior walls. Testing based on Section 2603.10 shall not be used to eliminate any component of the construction of an exterior wall assembly when that component was included in the construction that has met the requirements of Section 2603.5.5.

2603.10.2 Listed systems. Listed foam plastics tested to FM 4880, UL 1040 and UL 1715 shall be permitted to be used for the application for which they are listed.

Reason: Of the four tests included in this section, three have been in place since the legacy codes, namely FM 4880, UL 1040 and UL 1715. None of these tests actually measure smoke obscuration, while NFPA 286 does, and that is included in the criteria of section 803.2. In the case of UL 1715 smoke obscuration is being measured, but normally only qualitatively.

The ignition sources in these legacy tests are wood cribs or wood pallets and the one in NFPA 286 is a gas burner.

In actual fact, two of these legacy tests are not really intended for testing foam plastics as interior finish but are intended for systems intended for insulated wall construction (UL 1040) or insulated roof and wall construction (FM 4880). They are also extremely severe or onerous tests, since UL 1040 uses a 764 pound wood crib and FM 4880 uses a series of wood pallets adding up to 750 pounds (340 kg). Therefore the probability of them being used for approval of foam plastics for interior finish is low.

UL 1715 is actually intended for testing interior finish materials but exposes the test specimen on two walls only (and only 8 ft of the 12 ft wall), in a corner, to a 30 pound wood crib. NFPA 286 uses the same room dimensions except that the room is actually a full room and the test specimen is placed covering three walls and the ceiling, and the ignition source is a gas burner at 40 kW and then at 160 kW, with direct heat and smoke release and flame spread measurements.

Cost Impact: None

FS191-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.10-FS-HIRSCHLER

FS192 – 12

2603.11 (New), Chapter 35

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

2603.11 Wind Resistance. Foam plastic insulation complying with ASTM C 578 and ASTM C 1289 and used as exterior wall sheathing on framed wall assemblies shall comply with ANSI/FS 100 for wind pressure resistance.

Add new standard to Chapter 35 as follows:

Structural Building Components Association (SBCA)
6300 Enterprise Lane
Madison, Wisconsin 53719

Standard Reference number	Title	Referenced in code section
ANSI/FS 100-12	Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies ……….	2603.11

Reason: This ANSI standard (FS 100-12) is needed to address the use of foam plastic insulating sheathing in exterior wall covering assemblies where resistance to wind pressure is required. This standard provides a methodology by which a manufacturer can qualify their product, through testing, to meet the requirements of the I-codes in establishing the wind pressure resistance of the product. It also provides for on-going quality control procedures to ensure that the product continues to meet its qualified wind pressure resistance. The ANSI standard supplements the applicable ASTM materials standards also referenced in the code change proposal. The ANSI standard was approved by the standard project committee and in process of its public comment phase at the time this proposal was due to ICC (Jan 3, 2012). The current version of the standard is available for review at www.sbcindustry.com/fs100draft. It is expected that copies of the completed ANSI standard will be available prior to the code development hearings.

As a formatting note to ICC staff, there are other proposals by the proponent dealing with separate topics for wall sheathing applications of foam sheathing and they are being proposed with the same new section number (2306.11). Presuming that this proposal passes as well as any of the others, it is the proponent's desire to have them all organized under a Section 2306.11 for wall sheathing applications of foam plastic insulation.

Cost Impact: The code change proposal will not increase the cost of construction.

FS192-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.11 (NEW) #1-FS-CRANDELL

FS193– 12
2603.11 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

2603.11 Cladding attachment over foam sheathing to masonry or concrete wall construction. Cladding shall be specified and installed in accordance with Chapter 14 and the cladding manufacturer's installation instructions or an approved design. Foam sheathing shall be attached to masonry or concrete construction in accordance with the insulation manufacturer's installation instructions or an approved design. Furring and furring attachments through foam sheathing shall be designed to resist design loads determined in accordance with Chapter 16, including support of cladding weight as applicable. Fasteners used to attach cladding or furring through foam sheathing to masonry or concrete substrates shall be approved for application into masonry or concrete material and shall be installed in accordance with the fastener manufacturer's installation instructions.

Exceptions:

1. Where the cladding manufacturer has provided approved installation instructions for application over foam sheathing and connection to a masonry or concrete substrate, those requirements shall apply.
2. For exterior insulation and finish systems, refer to Section 1408.
3. For anchored masonry or stone veneer installed over foam sheathing, refer to Section 1405.

Reason: Two other proposals submitted on the topic of attachment of cladding through foam sheathing address wood and steel framing applications based on experimental data and rational analysis addressed in the reason statements for those proposals. Similar solutions and guidance for attachment of cladding to masonry/concrete walls through foam sheathing is needed. Research is not yet available to justify prescriptive "off-the-shelf" solutions with standardized types of concrete/masonry fasteners. Also, many fasteners best suited for this application are proprietary and approved data and design is the best approach. Therefore, this proposal requires engineered design of cladding connections through foam sheathing to masonry/concrete. The exceptions recognize cases where appropriate attachment solutions may already exist.

Cost Impact: The code change proposal will not increase the cost of construction.

FS193-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.11 (NEW) #2-FS-CRANDELL

FS194 – 12

2603.11 (New), 2603.11.1 (New), Table 2603.11.1 (New), 2603.11.2 (New), Table 2603.11.2 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

2603.11 Cladding attachment over foam sheathing to steel framing. Cladding shall be specified and installed in accordance with Chapter 14 and the cladding manufacturer's installation instructions. Where used, furring and furring attachments shall be designed to resist design loads determined in accordance with Chapter 16. In addition, the cladding or furring attachments through foam sheathing to framing shall meet or exceed the minimum fastening requirements of Section 2603.11.1, 2603.11.2, or an approved design for support of cladding weight.

Exceptions:

1. Where the cladding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.
2. For exterior insulation and finish systems, refer to Section 1408.
3. For anchored masonry or stone veneer installed over foam sheathing; refer to Section 1405.

2603.11.1 Direct attachment. Where cladding is installed directly over foam sheathing without the use of furring, cladding minimum fastening requirements to support the cladding weight shall be as specified in Table 2603.11.1.

TABLE 2603.11.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[1]

Cladding Fastener Through Foam Sheathing into:	Cladding Fastener -Type and Minimum Size[2]	Cladding Fastener Vertical Spacing (inches)	Maximum Thickness of Foam Sheathing[3] (inches)					
			16"oc Fastener Horizontal Spacing			24"oc Fastener Horizontal Spacing		
			Cladding Weight:			Cladding Weight:		
			3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Steel Framing (minimum penetration of steel thickness + 3 threads)	#8 screw into 33 mil steel or thicker	6	3	3	1.5	3	2	DR
		8	3	2	0.5	3	1.5	DR
		12	3	1.5	DR	3	0.75	DR
	#10 screw into 33 mil steel	6	4	3	2	4	3	0.5
		8	4	3	1	4	2	DR
		12	4	2	DR	3	1	DR
	#10 screw into 43 mil steel or thicker	6	4	4	3	4	4	2
		8	4	4	2	4	3	1.5
		12	4	3	1.5	4	3	DR

For SI: 1 inch = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa

DR = design required

o.c. = on center

a. Steel framing shall be minimum 33 ksi steel for 33 mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker.

b. Screws shall comply with the requirements of AISI S200.

c. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C 578 or ASTM C 1289.

2603.11.2 Furred cladding attachment. Where steel or wood furring is used to attach cladding over foam sheathing, furring minimum fastening requirements to support the cladding weight shall be as specified in Table 2603.11.2. Where placed horizontally, wood furring shall be preservative treated wood in accordance with Section 2303.1.8 or naturally durable wood and fasteners shall be corrosion resistant in accordance Section 2304.9.5. Steel furring shall have a minimum G60 galvanized coating.

TABLE 2603.11.2 FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[1]

Furring Material	Framing Member	Fastener Type and Minimum Size[2]	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring (inches)	Maximum Thickness of Foam Sheathing[4] (inches)					
					16"oc FURRING[5]			24"oc FURRING[5]		
					Cladding Weight:			Cladding Weight:		
					3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Minimum 33mil Steel Furring or Minimum 1x Wood Furring[3]	33 mil Steel Stud	#8 screw	Steel thickness + 3 threads	12	3	1.5	DR	3	0.5	DR
				16	3	1	DR	2	DR	DR
				24	2	DR	DR	2	DR	DR
		#10 screw	Steel thickness + 3 threads	12	4	2	DR	4	1	DR
				16	4	1.5	DR	3	DR	DR
				24	3	DR	DR	2	DR	DR
	43 mil or thicker Steel Stud	#8 Screw	Steel thickness + 3 threads	12	3	1.5	DR	3	0.5	DR
				16	3	1	DR	2	DR	DR
				24	2	DR	DR	2	DR	DR
		#10 screw	Steel thickness + 3 threads	12	4	3	1.5	4	3	DR
				16	4	3	0.5	4	2	DR
				24	4	2	DR	4	0.5	DR

For SI: 1" = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa.
DR = design required
o.c. = on center
1. Wood furring shall be Spruce-Pine-Fir or any softwood species with a specific gravity of 0.42 or greater. Steel furring shall be minimum 33 ksi steel. Steel studs shall be minimum 33 ksi steel for 33mil and 43 mil thickness and 50 ksi steel for 54 mil steel or thicker.
2. Screws shall comply with the requirements of AISI S200.
3. Where the required cladding fastener penetration into wood material exceeds ¾ inch (19.1 mm) and is not more than 1-1/2 inches (38.1 mm), a minimum 2 inch (51 mm) nominal wood furring shall be used or an approved design.
4. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C 578 or ASTM C 1289.
5. Furring shall be spaced a maximum of 24 inches (610 mm) on center, in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, the indicated 8 inch (203.2 mm) and 12 inch (304.8 mm) fastener spacing in furring shall be achieved by use of two fasteners into studs at 16 inches (406.4 mm) and 24 inches (610 mm) on center, respectively.

Reason: The proposed cladding connection requirements already exist in the New York State Energy Code which is based on the 2009 IECC. Similar requirements for the IECC 2012 were considered last code cycle, but it was clearly expressed that these provision are a better fit for the building code. These requirements fill an important need in the IBC provisions for exterior wall covering assemblies that include foam plastic insulation.

The proposed requirements are based on a project sponsored by the New York State Energy Research and Development Agency (NYSERDA) and the Steel Framing Alliance. The project report is available for download at http://data.memberclicks.com/site/sfa/NYSERDA_TASK_3_REPORT%20-%20FINAL_(3-22-10).pdf . The report explains the technical basis for the proposed requirements.

The purpose of the NYSERDA project was to develop prescriptive fastening requirements for cladding materials installed over foam sheathing to ensure adequate performance. The project included testing of cladding attachments through various thicknesses of foam sheathing using various fastener types on steel frame wall assemblies. Supplemental testing also was sponsored by the Foam Sheathing Coalition (lab report available at www.foamsheathing.org) to address attachments to wood framing and the resulting data is included in the data set analyzed and presented in the NYSERDA project report. The proposed cladding attachment requirements and foam sheathing thickness limits are based on rational analysis verified by the extensive test data to control cladding

connection movement to no more than 0.015" slip under cladding weight or dead load. This deflection controlled approach resulted in safety factors commonly in the range of 5 to 8 relative to average shear capacity.
Cost Impact: The code change proposal will not increase the cost of construction.

FS194-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.11 (NEW) #3-FS-CRANDELL

FS195 – 12

2603.11 (New), 2603.11.1 (New), Table 2603.11.1 (New), 2603.11.2 (New), Table 2603.11.2 (New)

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

2603.11 Cladding attachment over foam sheathing to wood framing. Cladding shall be specified and installed in accordance with Chapter 14 and the cladding manufacturer's installation instructions. Where used, furring and furring attachments shall be designed to resist design loads determined in accordance with Chapter 16. In addition, the cladding or furring attachments through foam sheathing to framing shall meet or exceed the minimum fastening requirements of Section 2603.11.1, 2603.11.2, or an approved design for support of cladding weight.

Exceptions:

1. Where the cladding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.
2. For exterior insulation and finish systems, refer to Section 1408.
3. For anchored masonry or stone veneer installed over foam sheathing, refer to Section 1405.

2603.11.1 Direct attachment. Where cladding is installed directly over foam sheathing without the use of furring, cladding minimum fastening requirements to support the cladding weight shall be as specified in Table 2603.11.1.

TABLE 2603.11.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[1]

Cladding Fastener Through Foam Sheathing into:	Cladding Fastener -Type and Minimum Size[b]	Cladding Fastener Vertical Spacing (inches)	Maximum Thickness of Foam Sheathing[3] (inches)					
			16” o.c. Fastener Horizontal Spacing			24” o.c. Fastener Horizontal Spacing		
			Cladding Weight:			Cladding Weight:		
			3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Wood Framing (minimum 1-1/4 inch penetration)	0.113” diameter nail	6	4	3	1	4	2	0.75
		8	4	2	0.75	4	1.5	DR
		12	4	1.5	DR	3	0.75	DR
	0.120” diameter nail	6	4	3	1.5	4	2	0.75
		8	4	2	1	4	1.5	0.5
		12	4	1.5	0.5	3	1	DR
	0.131” diameter nail	6	4	4	1.5	4	3	1
		8	4	3	1	4	2	0.75
		12	4	2	0.75	4	1	DR

For SI: 1 inch = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa

DR = design required

o.c. = on center

1. Wood framing shall be Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
2. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.

3. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C 578 or ASTM C 1289.

2603.11.2 Furred cladding attachment. Where wood furring is used to attach cladding over foam sheathing, furring minimum fastening requirements to support the cladding weight shall be as specified in Table 2603.11.2. Where placed horizontally, wood furring shall be preservative treated wood in accordance with Section 2303.1.8 or naturally durable wood and fasteners shall be corrosion resistant in accordance Section 2304.9.5.

TABLE 2603.11.2
FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[1,2]

Furring Material	Framing Member	Fastener Type and Minimum Size	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring (inches)	Maximum Thickness of Foam Sheathing[4] (inches)					
					16"oc FURRING[5]			24"oc FURRING[5]		
					Cladding Weight:			Cladding Weight:		
					3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Minimum 1x Wood Furring[3]	Minimum 2x Wood Stud	0.120" diameter nail	1-1/4	8	4	4	1.5	4	2	1
				12	4	2	1	4	1.5	0.5
				16	4	2	0.5	4	1	DR
		0.131" diameter nail	1-1/4	8	4	4	2	4	3	1
				12	4	3	1	4	2	0.75
				16	4	2	0.75	4	1.5	DR
		#8 wood screw[5]	1	12	4	4	1.5	4	3	1
				16	4	3	1	4	2	0.5
				24	4	2	0.5	4	1	DR
		¼" lag screw[5]	1-1/2	12	4	4	3	4	4	1.5
				16	4	4	2	4	3	1
				24	4	3	1	4	2	0.5

For SI: 1" = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa.
DR = design required
o.c. = on center
1. Wood framing and furring shall be Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
2. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.
3. Where the required cladding fastener penetration into wood material exceeds ¾ inch (19.1 mm) and is not more than 1-1/2 inches (38.1 mm), a minimum 2x wood furring shall be used or an approved design.
4. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C 578 or ASTM C 1289.
5. Furring shall be spaced a maximum of 24 inches (610 mm) on center, in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, the indicated 8 inch (203.2 mm) and 12 inch (304.8 mm) fastener spacing in furring shall be achieved by use of two fasteners into studs at 16 inches (406.4 mm) and 24 inches (610 mm) on center, respectively.

Reason: These siding connection requirements already exist in the New York State Energy Code which is based on the 2009 IECC. Similar requirements for the IECC 2012 were denied last year mainly because it was felt that they belonged in the building code, not the energy code. These requirements fill an information gap in the IBC provisions for exterior wall covering assemblies that include foam plastic insulation. This proposal is coordinated with other proposed changes to Chapter 14 and Chapter 26 to ensure related code provisions are properly linked and addressed. Separate proposals address connection to other wall framing materials.

The proposed requirements are based on a project sponsored by the New York State Energy Research and Development Agency (NYSERDA). The project report is available for download at http://data.memberclicks.com/site/sfa/NYSERDA_TASK_3_REPORT%20-%20FINAL_(3-22-10).pdf . The report explains the technical basis for the proposed requirements.

The purpose of the NYSERDA project was to develop prescriptive fastening requirements for cladding materials installed over foam sheathing to ensure adequate performance. The project included testing of cladding attachments through various thicknesses of foam sheathing using various fastener types on steel frame wall assemblies. Supplemental testing also was sponsored by the Foam Sheathing Coalition (lab report available at www.foamsheathing.org) to address attachments to wood framing and the resulting data is included in the data set analyzed and presented in the NYSERDA project report. The proposed cladding attachment requirements and foam sheathing thickness limits are based on rational analysis verified by the extensive test data to control cladding connection movement to no more than 0.015" slip under cladding weight or dead load. This deflection controlled approach resulted in safety factors commonly in the range of 5 to 8 relative to average shear capacity. Similar tests by other independent parties, such Wiss, Janey, & Elsner (unpublished data) and also Building Science Corporation for DOE's Building America program (report pending) have shown similar results or demonstrate that this proposal has erred to the conservative.

Three separate proposals for wood , steel, and concrete/masonry wall applications have been prepared to ensure that these different applications are considered independently. If one or more these proposals are approved, the proponent will work with ICC staff to resolve duplicative formatting/numbering of the proposed new code sections.

Cost Impact: The code change proposal will not increase the cost of construction.

FS195-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2603.11 (NEW) #4-FS-CRANDELL

FS196 – 12
2604.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

Revise as follows:

2604.1 General. Plastic materials installed as interior finish or *trim* shall comply with Chapter 8. Foam plastics shall only be installed as interior finish where approved in accordance with the special provisions of Section 2603.10. Foam plastics that are used as interior finish shall also meet the flame spread <u>and smoke developed</u> index requirements for interior finish in accordance with Chapter 8. Foam plastics installed as interior *trim* shall comply with Section 2604.2.

Reason: This proposal is a further clarification and is consistent with previous changes incorporated in the 2012 IBC. In the 2012 IBC, additional language was introduced to 2603.9 to clarify that both the flame spread and smoke developed requirements of Chapter 8 must be complied with for foam plastics that are used as interior finish on the basis of special tests in accordance with 2603.10 of the 2012 IBC.

Section 2603.10 permits foamed plastic insulation to be used as interior wall or ceiling finish in plenums even without the installation of a thermal barrier. Similarly here, the thermal barrier specified in Section 2603.4 is not required under the conditions set forth in Sections 2603.4.1.1 through 2603.4.1.14. Consequently, the smoke developed provisions need to be clearly identified. This would make 2604.1 consistent with 2603.10 in this regard.

Cost Impact: This proposal should not increase the cost of construction.

FS196-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2604.1-FS-CRIMI

FS197 – 12
2610.2

Proponent: Mike Ennis, representing SPRI Inc. (m.ennis@mac.com)

Delete and substitute as follows:

2610.2 Mounting. The light-transmitting plastic shall be mounted above the plane of the roof on a curb constructed in accordance with the requirements for the type of construction classification, but at least 4 inches (102 mm) above the plane of the roof. ~~Edges of the light-transmitting plastic skylights or domes shall be protected by metal or other approved noncombustible material, or~~ The light transmitting plastic dome or skylight shall be shown to be able to resist ignition where exposed at the edge to a flame from a Class B brand as described in ASTM E 108 or UL 790. The Class B brand test shall be conducted on a skylight that is elevated to a height as specified in the manufacturer's installation instructions, but not less than 4 inches (102 mm).

Exceptions:

1. Curbs shall not be required for skylights used on roofs having a minimum slope of three units ertical in 12 units horizontal (25-percent slope) in occupancies in Group R-3 and on buildings with a nonclassified roof covering.
2. ~~The metal or noncombustible edge material~~ Class B brand testing as described in ASTM E 108 or UL 790 is not required where nonclassified roof coverings are permitted.

Reason: The flames of the Class B brand can extend above the noncombustible edge and contact the dome, allowing for the possibility of catching fire and test failure. ASTM E108 tests have been conducted on products with non-combustible edge material in which the flame extended beyond the noncombustible edge material resulting in ignition and burning of the plastic dome. To evaluate plastic dome skylights for fire resistance testing per ASTM E108 or UL790 with a Class B brand should be the base requirement. Skylights having non-combustible edges should not be exempted from the fire testing.

The video file showing the ASTM E108 or UL790 Class B brand test being conducted on a plastic dome skylight, with the minimum allowable edge height of 4-inches is too large to be sent with the proposal. It can be viewed at the following link: http://www.spri.org/publications/policy.htm. The video is located at the bottom of the page under Miscellaneous. The edge material in this video is noncombustible.

Cost Impact: This code change proposal will not increase the cost of construction, however it will increase the cost associated with plastic domed skylights meeting requirements of the IBC.

FS197-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2610.2-FS-ENNIS

FS198 – 12

202, 1410 (New), 2601, 2602, 2612 (New), Chapter 35

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

SECTION 202
DEFINITIONS

<u>**PLASTIC COMPOSITE.** A generic designation that refers to wood/plastic composites and plastic lumber.</u>

<u>**PLASTIC LUMBER. A** manufactured product made primarily of plastic materials (filled or unfilled) which is generally rectangular in cross-section and is typically supplied in sizes that correspond to traditional lumber board and dimensional lumber sizes.</u>

<u>**WOOD/PLASTIC COMPOSITE.** A composite material made primarily from wood or cellulose-based materials and plastic.</u>

Add new text as follows:

<u>**SECTION 1410**</u>
<u>**PLASTIC COMPOSITE DECKING**</u>

<u>**1410.1** Exterior deck boards, stair treads, handrails and guardrail systems constructed of plastic composites, including plastic lumber, shall comply with Section 2612.</u>

Revise as follows:

SECTION 2601
GENERAL

2601.1 Scope. These provisions shall govern the materials, design, application, construction and installation of foam plastic, foam plastic insulation, plastic veneer, interior plastic finish and trim<u>,</u> ~~and~~ light-transmitting plastics<u>, and plastic composites, including plastic lumber</u>. See Chapter 14 for requirements for exterior wall finish and trim.

SECTION 2602
DEFINITIONS

2602.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FIBER-REINFORCED POLYMER
FOAM PLASTIC INSULATION
LIGHT-DIFFUSING SYSTEM
LIGHT-TRANSMITTING PLASTIC ROOF PANELS
LIGHT-TRANSMITTING PLASTIC WALL PANELS
PLASTIC, APPROVED
<u>**PLASTIC COMPOSITE**</u>
PLASTIC GLAZING
<u>**PLASTIC LUMBER**</u>
THERMOPLASTIC MATERIAL

THERMOSETTING MATERIAL
WOOD/PLASTIC COMPOSITE

SECTION 2612
PLASTIC COMPOSITES

2612.1 General. Plastic composites shall consist either of wood/plastic composites or of plastic lumber. Plastic composites shall comply with the provisions of this code and with the additional requirements of Section 2612.

2612.2 Labeling and identification. Packages and containers of plastic composites used in exterior applications delivered to the job site shall bear the *label* of an *approved agency* showing the manufacturer's name, product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

2612.2.1 Performance levels. The label for plastic composites used in exterior applications as deck boards, stair treads, handrails and guardrail systems shall indicate the required performance levels and demonstrate compliance with the provisions of ASTM D7032. If the plastic composites are plastic lumber materials, the label shall additionally indicate compliance with the provisions of ASTM D6662.

2612.2.2 Loading. The label for plastic composites used in exterior applications as deck boards, stair treads, handrails and guardrail systems shall indicate the type and magnitude of the load determined in accordance with ASTM D7032 or with ASTM D6662, as appropriate.

2612.3 Flame Spread Index. Plastic composites required elsewhere in this code to comply with fire safety requirements, including a flame spread index, shall have those properties determined in accordance with Chapter 8. Otherwise, wood/plastic composite materials shall meet the requirements of ASTM D7032 and plastic lumber materials shall meet the requirements of ASTM D6662.

Exception: materials determined to be noncombustible in accordance with Section 703.5.

2612.4 Termite and Decay resistance. Plastic composites containing wood, cellulosic or any other biodegradable materials shall be termite and decay resistant as determined in accordance with Section 4.8 of ASTM D7032.

2612.5 Construction requirements. Plastic composites shall be permitted to be used as structural components of exterior deck boards, stair treads, handrails and guardrail systems in buildings of Class VB construction. Plastic composite decking shall also comply with the requirements of Section 2612.6.

2612.5.1 Span rating. Plastic composites used as structural components of exterior deck boards shall have a span rating determined in accordance with ASTM D7032 with a deflection limit of L/360.

2612.5.2 Differential movement of components. Plastic composites used as structural elements of exterior deck boards shall have approved fastening to allow for differential movement of the structural members to which the materials are fastened.

2612.5.3 Handrails and Guards. Plastic composites used in handrail systems shall comply with the requirements of Section 1012. Plastic composites used in guardrail systems shall comply with the requirements of Section 1013.

2612.6 Plastic composite decking. Plastic composite decking shall be designed and installed in accordance with the general provisions of this code and Sections 2612.6.1 through 2612.6.2.

2612.6.1 General. Each piece of decking composed of plastic composites shall be square-end trimmed. When random lengths are furnished, each piece shall be square end trimmed across the face so that at least 90 percent of the pieces are within 0.5 degrees (0.00873 rad) of square. The ends of the pieces shall be permitted to be beveled up to 2 degrees (0.0349 rad) from the vertical with the exposed face of the piece slightly longer than the opposite face of the piece. Tongue-and groove decking shall be installed with the tongues up on sloped or pitched roofs with pattern faces down.

2612.6.2 Layup patterns. Decking composed of plastic composites is permitted to be laid up following one of five standard patterns as defined in Sections 2304.8.2.1 through 2304.8.2.5 for lumber decking. Other patterns are permitted to be used provided they are substantiated through engineering analysis.

Add new standards as follows:

CHAPTER 35
REFERENCED STANDARDS

ASTM D6662, Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards
ASTM D7032, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)

Reason: This proposal recommends permitting the use of plastic composites for exterior applications as deck boards, stair treads, handrails and guardrail systems in buildings of Class VB construction. Since these materials contain significant amounts of plastic components, they are probably best included in a new separate section of Chapter 26. The requirements shown mirror those of wood decks/lumber decking.

Plastic composites can be plastic lumber or wood plastic composites. Both types of products are made of plastic materials with added fibrous materials to provide stiffness. There are some differences between the two, but they are relatively subtle. Wood plastic composites contain wood materials, or cellulosic materials, (normally over 50%) as the primary fiber that provides the stiffness. On the other hand plastic lumber materials contain primarily plastic (normally over 50%) and use a variety of materials to provide stiffness, often fiberglass. Specifications have been issued by ASTM for both types of plastic composite; the materials (and the specifications) fall under the jurisdiction of different technical committees. Committee D07 (on wood) issued ASTM D7032, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), presently referenced both in the IRC and in the IWUIC. Committee D20 (on plastics) issued ASTM D6662, Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards, presently referenced in the IWUIC.

Numerous plastic lumber decks are used throughout the US, but neither the IRC nor the IBC reference them. The IBC also does not reference wood plastic composite decks, and the requirements are similar. The ICC Evaluation Services recognizes both types of materials under Acceptance Criteria AC 174, Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails). It is suitable to incorporate these materials into the IBC in a separate section under Chapter 26 (plastics) and permit them to be used for decks in Class VB construction.

Specification ASTM D6662, for plastic lumber decking boards, requires the plastic lumber to comply with properties based on the following ASTM standards:

ASTM D2565 Standard Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications
ASTM D2915 Standard Practice for Evaluating Allowable Properties for Grades of Structural Lumber
ASTM D4329 Standard Practice for Fluorescent UV Exposure of Plastics
ASTM D6109 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products
ASTM D6341 Standard Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between −30 and 140°F [−34.4 and 60°C]
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G151 Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources
ASTM G154 Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
ASTM G155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

Specification ASTM D7032 requires the material to comply with many of the same properties. They include flexural properties (ASTM D6109), Xenon-arc exposure (ASTM D2565),), structural lumber grade classifications (ASTM D2915). In fact, it requires UV resistance in accordance with ASTM D6662.

Specification ASTM D7032 also requires the material to comply with biodeterioration tests (decay, fungi and termite resistance) if the material contains wood, cellulosic or other biodegradable materials (section4.8). Resistance to termites is assessed via ASTM D3345 or AWPA E1 and resistance to fungal decay in accordance with ASTM D1413, ASTM D2017 or AWPA E10. This is included in the code proposal for plastic composite materials.

With regard to fire properties, ASTM D6662 requires that plastic lumber meet ASTM E84, Steiner tunnel test, with a flame spread index of no more than 200, with a material that is required to remain in place during the test. The wording with regard to ASTM E84 flame spread testing in ASTM D6662 is very explicit, and much clearer than the wording in the test method itself. The requirements in ASTM D6662 ensure that no material "passes" the ASTM E84 test while falling to the tunnel floor before the flame progresses that far. The following wording is included in the ASTM D6662 standard:

"6.4.2 The test specimen shall either be self-supporting by its own structural characteristics or held in place by added supports along the test specimen surface. The test specimen shall remain in place throughout the test duration, without such severe sagging that it interferes with the effect of the gas flame on the test specimen. Test results are invalid if the bulk of the test specimen melts or drops to the furnace floor."

ASTM D7032 also requires wood-plastic composite decking materials to comply with a flame spread index of no more than 200 when tested to ASTM E84. However, ASTM D7032 does not have the additional requirements that the material stay in place. It also allows (as does AC 174) the use of alternate fire test methods for assessing fire performance of the wood plastic composite materials.

This proposal requires that wood plastic composite materials comply with the requirements of ASTM D7032 and that plastic lumber materials comply with the requirements of both ASTM D6662 and ASTM D7032, thereby including in the code all physical and mechanical property and fire test requirements associated with both types of decking materials. It is not clear whether wood plastic composite materials are always capable of complying with all the requirements of ASTM D6662, including the fire test.

Just for information: wood materials normally comply with a flame spread index of no more than 200.

Structural plastic lumber materials exhibit long lasting, weather resistance together with the structural characteristics of dimensional wood lumber. The materials are made primarily from recycled plastics from post-consumer waste like plastic milk and detergent bottles. The materials then include strengthening additives, UV–inhibited pigments, anti-oxidant processing aids and foaming agents for a highly stable material that is at least equivalent to wood lumber in some measures.

For information, the fire test required by AC 174 is optional, as it states that it requires a "flame spread rating … determined by testing in accordance with section 4.9 of ASTM D7032". The complete section of AC 174 reads as follows:

"The flame-spread rating of materials used to fabricate deck boards and components of guardrail systems (guards and handrails) shall be determined by testing in accordance with Section 4.9 of ASTM D 7032. Alternatively, any other approved test procedure is permitted to be used for determining a flame-spread rating of the materials that will give comparable results to tests conducted in accordance with ASTM E 84."

ASTM D7032 states as follows:

"4.9 *Fire Performance Tests* — The flame-spread rating of materials used to fabricate deck boards, guards, and handrails shall be determined by testing in accordance with Test Method E 84.

4.9.1 *Criterion*—Materials shall have a flame-spread index no greater than 200 when tested in accordance with Test Method E 84.

NOTE 5 — Other test procedures may be permitted for determining a flame-spread rating for the material. Depending upon material formulation, other fire performance tests may be required. Additionally, fire performance properties other than flame spread may be important. Test Methods E 1354 or D 1929, or procedures in Annex A2 may be used to provide an assessment of one or more of the following properties: smoke release rate, mass loss rate, heat release rate, ignition temperatures, and spread of flame. "

A few photographs of some actual plastic lumber decks follow.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASTM D7032 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS198-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-PLASTIC COMPOSITE (NEW)-G-HIRSCHLER

FS199 – 12

202, 720.2.1, 2614 (New)

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Manufacturers Association International (KEN@NRGCODEADVOCATES.COM)

Add new definition as follows:

Radiant Barrier. A material having a low emittance surface (0.1 or less) and when installed in building assemblies, the low emittance surface shall face a ventilated or unventilated air space.

Revise as follows:

720.2.1 Facings. Where such materials are installed in concealed spaces in buildings of Type III, IV or V construction, the flame spread and smoke-developed limitations do not apply to facings, coverings, and layers of reflective foil insulation that are installed behind and in substantial contact with the unexposed surface of the ceiling, wall or floor finish.

Exceptions:

1. All layers of single and multilayer reflective plastic core insulation shall comply with Section 2613.
2. All radiant barrier with plastic core shall comply with Section 2614.

Add new text as follows:

SECTION 2614
RADIANT BARRIER with PLASTIC CORE

2614.1 General. The provisions of this section shall govern the requirements and uses of radiant barrier with plastic core in buildings and structures. Radiant barrier with plastic core shall comply with the requirements of Section 2614.2 and with Section 2614.3 or 2614.4.

2614.2 Identification. Packages and containers of radiant barrier with plastic core delivered to the job site shall show the manufacturers or supplier's name, product identification and information sufficient to determine that the end use will comply with code requirements.

2613.3 Surface-burning characteristics. Radiant barrier with plastic core shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in accordance with ASTM E84 or UL 723. The radiant barrier with plastic core shall be tested at the maximum thickness intended for use. Test specimen preparation and mounting shall be in accordance with ASTM E2599.

Exception: Does not apply to radiant barrier applied to structural sheathing.

2613.4 Room corner test heat release. Radiant barrier with plastic core shall comply with the acceptance criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 or UL 1715 in the manner intended for use and at the maximum thickness intended for use.

Exception: Does not apply to radiant barrier applied to structural sheathing.

Reason: Product design innovations have resulted in a radiant barrier product configuration that requires the same treatment as *reflective plastic core insulation* as it pertains to flame/smoke safety. This proposal will require the same flame/smoke requirements for radiant barriers to be the same established by UL 723 or ASTM E84 as documented in Section 2613.3.

This proposal is intended to establish a new section on radiant barriers without the confusion as to whether the material is a radiant barrier or an insulator. The sections in chapter 26 address different types of plastic. In order to be consistent with the previous actions in this chapter, this proposal adds another plastic based product used in the construction industry that will be defined and approved for use. Product design innovations have resulted in a radiant barrier product configuration that requires the same treatment as reflective plastic core insulation as it pertains to flame/smoke safety – these products also contain plastic cores. As far back as the 1970s, sheets of metalized polyester called space blankets have been commercially available as a means to prevent hypothermia and other cold weather injuries. Because of their durability and light weight, these blankest are popular for survival and first aid applications. Swarms of people can be seen draped in reflective metalized film after a marathon, especially where the temperatures are particularly cold, like during the annual ING New York City marathon which takes place in the fall. In other words, aluminum is a good heat reflector and a bad heat radiator.

Radiant Barrier Systems (RBS) is a mature energy-saving technology having first been evaluated in the late 1950s (Joy, 1958).

Aluminum foil or metalized films, are the operative materials in many radiant barrier products. They have two physical properties of interest. First, they reflect thermal radiation very well. Second, they emit (gives off) very little heat. Most innovations now are materials related. For instance, industry has recently begun to manufacture roof plywood decking with a radiant barrier already adhered to its underside. Although reducing labor costs for new construction, it has little application to a retrofit technology. Probably the greatest potential for performance enhancement comes from proper installation. Proper installation of radiant barrier systems are covered in design notes from Florida Solar Energy Center (Fairey, 1984) and from ASTM standard C-1158.

Radiant Barriers can be incorporated into window treatments, roofs and attics, and walls. Wrapping a house with radiant barrier can result in a 10% to 20% reduction in the tonnage of air conditioning system requirement, and save both energy and construction costs.

Ingrid Melody and her publication: Radiant Barriers: A Question and Answer Primer address the proper use and applications of radiant barriers, the energy savings and case studies where radiant barriers have been evaluated.
http://www.fsec.ucf.edu/en/publications/html/fsec-en-15/

Results from a recent comprehensive field monitoring study conducted for Florida Power Corporation (FPC) by FSEC on the performance of attic radiant barrier systems in central Florida homes may be viewed by reading "FPC Residential Monitoring Project: New Technology Development - Radiant Barrier Pilot Project".
http://www.fsec.ucf.edu/en/publications/pdf/FSEC-DN-6-86.pdf
http://www.fsec.ucf.edu/en/publications/pdf/FSEC-DN-7-84.pdf
Additional Reference material by Florida Solar Energy Center:

References:

ASTM C1313/C1313M-10 Standard Specification for Sheet Radiant Barriers for Building Construction Applications
C1744-10 Practice for Installation and Use of Radiant Barrier Systems (RBS) in Commercial/Industrial Building Construction

Selected References:

Danny S. Parker , Jeffrey K. Sonne , John R. Sherwin “ Flexible Roofing Facility: 2002 Summer Test Results”, Prepared for: U.S. Department of Energy Building Technologies Program, July 2003

Parker, D., Sherwin, J., "Comparative Summer Attic Thermal Performance of Six Roof Contructions," The 1998 ASHRAE Annual Meeting, Toronto, Canada, June 20-24, 1998.

Parker, D., Sherwin, J., Sonne, J., Barkaszi, S., Floyd, D., Withers, C., "Measured Energy Savings of a Comprehensive Retrofit in an Existing Florida Residence," For the Florida Energy Office, December, 1997

Fairey, P., "Designing and Installing Radiant Barrier Systems," FSEC-DN-7, Florida Solar Energy Center, Cape Canaveral, FL, 1984.

Fairey, P., "Effects of Infrared Radiation Barriers on the Effective Thermal Resistance of Building Envelopes," proceedings of the ASHRAE/DOE Conference on Thermal Performance of the Exterior Envelopes of Buildings II, Las Vegas, NV, December 1982.

Fairey, P., "The Measured Side-by-Side Performance of Attic Radiant Barrier Systems in Hot-Humid Climates," proceedings of the 19th International Thermal Conductivity Conference, Cookeville, TN, October 1985.

Fairey, P., "Radiant Energy Transfer and Radiant Barrier Systems in Buildings," FSEC-DN-6, Florida Solar Energy Center, Cape Canaveral, FL, 1984.

Joy, F.A., "Improving Attic Space Insulating Values," **ASHAE Transactions,** Vol.64, 1958.

"Radiant Barriers: How They Work and How to Install Them," videotape, FSEC Producer, Cape Canaveral, FL, 1986.

Van Stratten, J.F., **Thermal Performance of Buildings,** New York: Elsevier Publishing, 1967.

Cost Impact: The code change proposal will not increase the cost of construction.

FS199-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

720.1-FS-SAGAN-2614 (NEW)-FS-SAGAN

FS200 – 12
Appendix L (New), Chapter 35

Proponent: Stephen V. Skalko, representing Portland Cement Association; Eric T. Stafford, representing Institute for Business and Home Safety; Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Add new text as follows:

APPENDIX L
BUILDING RESILIENCE

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION L101
GENERAL

L101.1 Purpose. The purpose of this appendix is to promote enhanced public health, safety and general welfare and to reduce public and private property losses due to hazards and natural disasters associated with fires, flooding, high winds and earthquakes.

SECTION L102
EXTERIOR WALLS

L102. 1 General. In addition to the requirements for Exterior Walls in Chapter 14 of the *International Building Code,* the exterior wall coverings shall also comply with Sections L102.2 through L102.4.

L102.2 Exterior wall covering limitations for reduced damage from fire. Exterior wall coverings shall comply with L102.2.1 and L102.2.2 to reduce damage from fire exposure

L102.2.1 Vinyl siding and Exterior insulation and finish systems (EIFS). Vinyl siding conforming to the requirements of Chapter 14 of the *International Building Code* and Exterior insulation and finish systems (EIFS) conforming to the requirements of Chapters 14 and 26 of the *International Building Code* shall only be permitted to be installed on exterior walls of buildings with a minimum fire separation distance of 30 feet.

L102.2.2 Fire Separation 5 Feet or Less. Combustible exterior wall coverings are not permitted on exterior walls having a fire separation distance or 5 feet (1524 mm) or less.

L102.3 Exterior wall covering limitations for reduced damage from hail. Vinyl siding conforming to the requirements of Chapter 14 of the *International Building Code* and Exterior insulation and finish systems (EIFS) conforming to the requirements of Chapters 14 and 26 of the *International Building Code* shall comply with sections L102.3.1 and L102.3.2.

L102.3.1 Hail Exposure regions. Hail exposure regions in Figure L102.3 shall be as follows:

(a) **Moderate** - One or more hail days with hail diameters greater than 1.5 in (38 mm) in a twenty (20) year period.
(b) **Severe** - One or more hail days with hail diameters greater than 2.0 in (50 mm) in a twenty (20) year period.

L102.3.2 Exterior wall coverings subject to hail exposure. Wall coverings used in regions where hail exposure is Moderate or Severe, as determined in accordance with Section L102.3.1 and Figure L102.3, shall be tested, classified, and labeled in accordance with UL 2218 or FM 4473.

L102.4 Exterior wall covering limitations for reduced damage from wind. Vinyl siding and Exterior insulation and finish systems (EIFS) conforming to the requirements of Chapter 14 of the *International Building Code* shall only be permitted to be installed on exterior walls of buildings located outside hurricane-prone regions as defined in Section 1609.2.

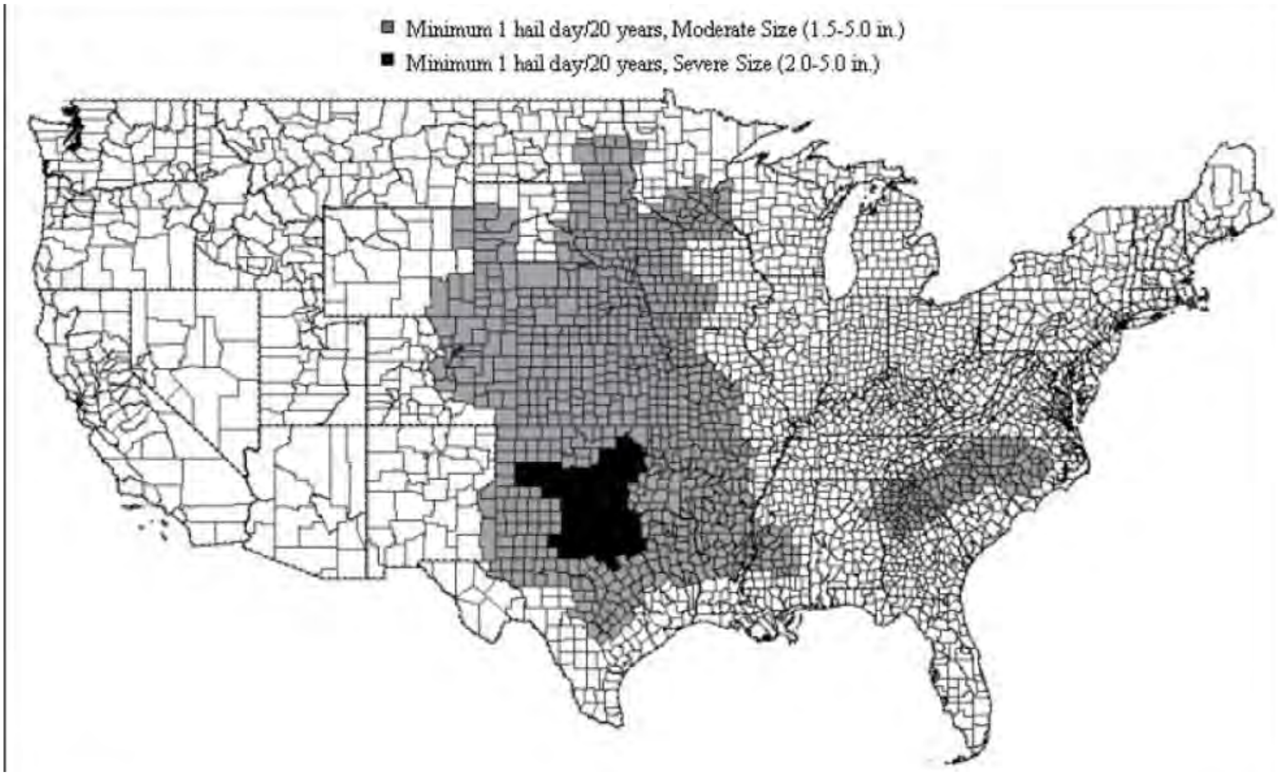


FIGURE L102.3

SECTION L103
ROOF ASSEMBLIES

L103.1 General. In addition to the requirements for Roof Assemblies and Rooftop Structures in Chapter 15 of the *International Building Code,* the roof coverings shall also comply with Sections with Sections L103.2 through L103.4.

L103.2 Non-classified roofs. Non-classified roof coverings in accordance with Section 1505.5 of the *International Building Code* shall not be permitted on *buildings.*

L103.3 Roofs in Warm and Dry Climates. Roofs in climate zones 1, 2, 3, 4, 5B (dry), and 6B (dry) of the *International Energy Conservation Code (IECC)* shall have a Class A roof covering or Class A roof assembly according to UL 790. For roof coverings where the profile allows a space between the roof covering and roof decking, the space at the eave ends shall be firestopped to preclude entry of flames or embers.

L103.4 Roof coverings subject to hail exposure. Roof coverings used in regions where hail exposure is Moderate or Severe, as determined in accordance with Section L103.4.1 and Figure L102.3, shall be tested, classified, and labeled in accordance with UL 2218 or FM 4473.

L103.4.1 Hail Exposure regions in Figure L102.3 shall be as follows:

- **(a) Moderate** - One or more hail days with hail diameters greater than 1.5 in (38 mm) in a twenty (20) year period.
- **(b) Severe** - One or more hail days with hail diameters greater than 2.0 in (50 mm) in a twenty (20) year period.

Add standards to Chapter 35 as follows:

UL 2218-10 *Impact Resistance of Prepared Roof Covering Materials. UL 2218, Impact Resistance of Prepared Roof Covering Materials*.

FM 4473-11 *Specification Test Standard for Impact Resistance Testing of Rigid Roof Materials by Impacting With Freezer Ice Balls*.

Reason: This reason statement has the following two segments to explain the reasons for this change: (A) The code change is explained with specific substantiation; and (B) General background information identifying the need for enhanced property protection and functional resilience for to strengthen the built environment;

(A)

The following are reports of dollar loss to property from wind, cold weather and fire disasters.

- The American Society of Civil Engineers reported in *Normalized Hurricane Damage in the United States*, *1900 – 2005,* National Hazard Review, ASCE 2008, that property damage from hurricanes was 81 billion dollars in 2005.

- The National Weather Service reports that U.S. property damage due to winter storms and ice exceeded 1.5 billion dollars in 2009.

- *Fire Losses in the United States During 2009* by the National Fire Protection Association, August 2010 shows that property loss due to structure fires in buildings other than one and two family dwellings was approximately 4.5 billion dollars.

Increasing the stringency of the design criteria of buildings for hazards such as wind, snow or fire results in more robust buildings. Such requirements reduce the amount of energy and resources required for repair, removal, disposal and replacement of building components and systems damaged from these disasters. A further benefit is a reduction in the amount of damaged building materials and content entering landfills.

Additional benefits are enhanced life safety, security and occupant comfort; potentially less demand on community resources required for emergency response; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future.

(B)

Minimum building requirements whether through energy codes, plumbing codes, mechanical codes, zoning codes, or basic building codes, do not encourage truly sustainable buildings. The proposal is one of several that attempt to integrate the concepts of the *Whole Building Design Guide* (WBDG) into the International Building Code as a non-mandatory Appendix. This allows adopting jurisdictions the option of incorporating code requirements into the building code to improve the resilience of the built environment without the need to add another code to the community requirements.

The WBDG, developed in partnership between the National Institute of Building Sciences (NIBS) and the Sustainable Building Industries Council (SBIC), has as its key concepts: accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable.

There are numerous references about the economic, societal, and environmental benefits that result when enhanced functional resilience for resource minimization are integrated into building design and construction. Six examples demonstrating the importance and supporting the concepts are:

1. ***Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities***
   National Institute of Building Sciences Multi-Hazard Mitigation Council - 2005
   One of the findings in this report is "The analysis of the statistically representative sample of FEMA grants awarded during the study period indicates that a dollar spent on disaster mitigation saves society an average of $4." The programs studied often addressed issues and strategies other than enhanced disaster resistance of buildings and other structures. However, more disaster-resistant buildings enhance life safety; reduce costs and environmental impacts associated with repair, removal, disposal, and replacement; and reduce the time and resources required for community recovery.

2. ***Five Years Later – Are we better prepared?***
   Institute for Business and Home Safety - 2010
   This IBHS report states: "When Hurricane Katrina made landfall on Aug. 29, 2005, it caused an estimated $41.1 billion in insured losses across six states, and took an incalculable economic and social toll on many communities. Five years later, the

recovery continues and some residents in the most severely affected states of Alabama, Louisiana and Mississippi are still struggling. There is no question that no one wants a repeat performance of this devastating event that left at least 1,300 people dead. Yet, the steps taken to improve the quality of the building stock, whether through rebuilding or new construction, call into question the commitment of some key stakeholders to ensuring that past mistakes are not repeated." This report indicates that there is a need to implement provisions to make buildings more disaster-resistant. Clearly this suggests that functional resilience should at least be integrated into the design and construction of sustainable buildings.

3. **National Weather Service Office of Climate, Water and Weather Services**
National Oceanic and Atmospheric Administration (NOAA) - 2010
Data provided on the NOAA website [www.weather.gov/os/hazstats.shtml] indicates that the average annual direct property loss due to natural disasters in the United States exceeds of $35,000,000,000. This does not include indirect costs associated with loss of residences, business closures, and resources expended for emergency response and management. These direct property losses also do not reflect the direct environmental impact due to reconstruction after the disasters. Functional resilience will help alleviate the environmental impact and minimize both direct and indirect losses from natural disasters.

4. ***Global Climate Change Impacts in the United States***
U.S. Global Change Research Program (USGCRP) - 2009
The USGCRP includes the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation; National Aeronautic and Space Administration; Environmental Protection Agency, USA International Development, National Science Foundation and Smithsonian Institution
The report identifies that: "Climate changes are underway in the United States and are projected to grow. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow." The report further identifies that the: "Threats to human health will increase. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts." Key messages in the report on societal impacts include:
- "City residents and city infrastructure have unique vulnerabilities to climate change. "
- "Climate change affects communities through changes in climate-sensitive resources that occur both locally and at great distances."
- "Insurance is one of the industries particularly vulnerable to increasing extreme weather events such as severe storms, but it can also help society manage the risks."

Sustainable building design and construction cannot be about protecting the natural environment without consideration of the projected growth in severe weather. Minimum codes primarily based on past natural events are not appropriate for truly sustainable buildings. Buildings expected to have long term positive impacts on the environment must be protected from these extreme changes in the natural environment. The provisions for improved property protections are necessary to reduce the amount of energy and resources associated with repair, removal, disposal, and replacement due to routine maintenance and damage from disasters. Further such provisions reduce the time and resources required for community disaster recovery.

5. ***Sustainable Stewardship -*** *Historic preservation plays an essential role in fighting climate change ,*
Traditional Building, National Trust for Historic Preservation - 2008
In the article Richard Moe summarizes the results of a study by the Brookings Institution which projects that by 2030 we will have demolished and replaced 82 billion square feet of our current building stock, or nearly 1/3 of our existing buildings, largely because the vast majority of them weren't designed and built to last any longer. Durability, as a component of functional resilience, can reduce these losses.

6. **Opportunities for Integrating Disaster Mitigation and Energy Retrofit Programs**
Senate Environment and Public Works Committee Room, Dirksen Senate Office Building, Washington, D.C. - 2010
During this panel discussion a representative of the National Conference of State Historic Preservation Officers noted that more robust buildings erected prior to 1950 tend to be more adaptable for reuse and renovation. Prior to the mid-1950s most local jurisdictions developed their own building code requirements that uniquely addressed the community's needs, issues and concerns. Pre-1950 building codes typically resulted in more durable and robust construction that lasts longer.

The total environmental impact of insulation, high efficiency equipment, components, and appliances, low-flow plumbing fixtures, and other building materials and contents are relatively insignificant when rendered irreparable or contaminated and must be disposed of in landfills after disasters. The US Army Corps of Engineers estimated that after Hurricane Katrina nearly 1.2 billion cubic feet of building materials and contents ended up in landfills. This is analogous to stacking enough refrigerators a fifth of the way to the moon or placing them end to end around the equator of the Earth twice.

Cost Impact: This proposal may increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, UL 2218-10 and FM 4473-11, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FS200-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – GENERAL

GENERAL CODE COMMITTEE

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William Clayton, CBO
Building Codes Administrator (Chief Building Official)
City of Lakewood, Colorado
Lakewood, CO

James P. Colgate, RA. Esq.
Assistant Commissioner for Technical Affairs and Code Development
New York City Department of Buildings
New York, NY

David Frable
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US General Service Administration
Geneva, IL

Homer Maiel, PE, CBO
Town of Atherton
Atherton, CA

Anthony Merlino
Construction Official
Village of Ridgewood
Ridgewood, NJ

Sharon Myers, RA, MPE, CBO
Plans Examiner
State of Ohio, Bureau of Bldg Code Compliance
Reynoldsburg, OH

Daniel E. Nichols, PE
Fire Protection Engineer
New York State Division of Code Enforcement and Administration
Albany, NY

Gregory Nicholls,AIA
Chief Building Official
City of Mason, Ohio
Mason, OH

Carroll Pruitt, FAIA, NCARB
President/CEO
Pruitt Consulting Inc.
Fort Worth, TX

John Stovall
Rep: National Association of Home Builders
NSArchitects
Rockville, MD

Staff Secretariat
Beth Tubbs, PE
Senior Staff Engineer
Codes and Standards Development
ICC - Boston Field Office
Northbridge, MA

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

GENERAL

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

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

- G27-12
- G28-12
- G29-12
- G30-12
    - G1-12
- G31-12
- G32-12
- G34-12
- G35-12
- G36-12
- G37-12
    - G33-12
- G38-12
- G39-12
- G41-12
    - G40-12
- G42-12
- G43-12
- G44-12
- G45-12
- G46-12
- G47-12
    - G13-12
- G48-12
- G49-12
- G50-12
    - G256-12
- G53-12
- G54-12
- G55-12
- G56-12
- G60-12
- G61-12
- G62-12
- G63-12
- G64-12
- G65-12
    - G79-12
- G66-12
- G67-12
- G69-12
- G70-12
- G74-12
- G75-12
- G76-12
    - G92-12
- G77-12
- G80-12
    - G78-12
    - G97-12
    - G93-12
- G82-12
    - G19-12
- G83-12
- G84-12
- G86-12
- G87-12
- G88-12
- G89-12
- G90-12
- G91-12
- G94-12
- G95-12
- G96-12
- G98-12
- G99-12
- G100-12
    - G2-12
- G101-12
- G102-12
- G103-12
- G104-12
- G105-12
- G106-12
- G107-12
- G108-12
- G109-12
- G110-12
- G111-12
- G112-12
- G113-12
- G114-12
- G116-12
- G117-12
    - G115-12
- G118-12
- G119-12
- G120-12
- G121-12
- G122-12
- G123-12
- G124-12
- G125-12
- G126-12
- G128-12
- G127-12
- G129-12
- G130-12
- G131-12
- G132-12
- G133-12
- G134-12
- G135-12
- G136-12
- G137-12
- G138-12
    - S52-12
    - S65-12
- G139-12
- G140-12
- G141-12
- G142-12, Part I

G143-12
G144-12
G145-12
G146-12
G147-12
G148-12
G149-12
G150-12
G151-12
G152-12
G153-12
  M35-12
G154-12
G155-12
G156-12
G157-12
G158-12
G159-12
G160-12
G161-12
G162-12, Part I
G162-12, Part II
G162-12, Part III
G162-12, Part IV
G162-12, Part V
G162-12, Part VI
G162-12, Part VII
G163-12
G164-12
G165-12
G166-12
G167-12
G169-12
  G168-12, Part I
  G168-12, Part II
G170-12
G171-12
G172-12
G173-12
G174-12, Part I
G174-12, Part II
G175-12
G176-12
  G182-12
G177-12
G178-12
G179-12
  G185-12
  FS138-12
G180-12

G181-12
G183-12
G184-12
G190-12
G191-12
G192-12
G193-12, Part I
G193-12, Part II
G193-12, Part III
G193-12, Part IV
G194-12
G195-12
G196-12
G197-12
G198-12
  G203-12
G199-12
G200-12
G201-12
  G205-12 Part I
  G205-12 Part II
  G205-12 Part III
  G205-12 Part IV
  G205-12 Part V
  G205-12 Part VI
  G205-12 Part VII
  G205-12 Part VIII
  G205-12 Part IX
  G205-12 Part X
  G205-12 Part XI
  G205-12 Part XII
G202-12
G204-12
G206-12
G207-12
G208-12
G209-12
G210-12
G219-12
G220-12
G225-12
G226-12
G227-12
G229-12
G230-12
G231-12
G232-12
G233-12
G244-12
G246-12

G247-12
G248-12
G249-12
G250-12
G251-12
G252-12
G253-12
G254-12
G255-12

G1 – 12
202

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care, Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

24-HOUR ~~CARE~~ BASIS. The actual time that a person is an occupant within a facility for the purpose of receiving care. It shall not include a facility that is open for 24 hours and is capable of providing care to someone visiting the facility during any segment of the 24 hours**.**

Reason: This code change is intended to clarify the code. In the last code cycle a change was made attempting to clarify the phrase "24 hour basis". This term is used when determining the appropriate occupancy classification for facilities that provide custodial, medical or supervised care, including Group I-1, I-2 and R-4 (IBC 308.3, 308.4, 310.6). The committee accepted the clarification that in this context 24 hour care was intended to refer to the actual time that a patient is receiving care. Unfortunately, the code change used a phrase that was descriptive of the concept not the actual phrase used in the code. This code change corrects the term to the one used in code.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: The proposed changes with not increase the cost of construction.

G1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-24 HOUR BASIS-G-WILLIAMS-ADHOC

G2 – 12
202, Table 503

Proponent: Ron Burton, PTW advisors, LLC, representing Building Owners and Managers Association (BOMA) International (ronburton@ptwadvisors.com)

Revise as follows:

~~**AREA, BUILDING.** The area included within surrounding *exterior walls* (or *exterior walls* and *fire walls*) exclusive of vent *shafts* and *courts*. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.~~

AREA, TOTAL BUILDING FLOOR: The total area of all floors within a building shall be determined in accordance with one of the following:

1. ANSI/BOMA Z65.1.
2. ANSI/BOMA Z65.2.
3. ANSI/BOMA Z65.3.
4. ANSI/BOMA Z65.4.
5. ANSI/BOMA Z65.5.

AREA, TOTAL FLOOR: The floor area of a building shall be determined in accordance with one of the following:

1. ANSI/BOMA Z65.1.
2. ANSI/BOMA Z65.2.
3. ANSI/BOMA Z65.3.
4. ANSI/BOMA Z65.4.
5. ANSI/BOMA Z65.5.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of ~~"Area, building,"~~ "Area, Total Building Floor" per story
(Portions of table not shown remain unchanged)

Add new standards to Chapter 35 as follows:

BOMA
Building Owners and Managers Association (BOMA) International
1101 15th Street NW, Suite 800
Washington, DC 20005

ANSI/BOMA Z65.1-10 Office Buildings: Standard Methods of Measurement

ANSI/BOMA Z65.2-09 Industrial Buildings: Standard Methods of Measurement

ANSI/BOMA Z65.3-09 The Gross Areas of a Building: Standard Methods of Measurement

ANSI/BOMA Z65.4-10 Multi-Unit Residential Buildings: Standard Methods of Measurement

ANSI/BOMA Z65.5-10 Retail Buildings: Standard Methods of Measurement

Reason: In 1915, BOMA created the *Standard Method of Floor Measurement* for office buildings. This voluntary standard has gradually evolved through several updates to the current *Office Buildings: Standard Methods of Measurement (2010)*. Typically referred to as "the BOMA standard", it is now one of five ANSI certified measurement standards published by BOMA. Four of the standards address different product types – Office, Retail, Industrial and Multi-Unit Residential buildings – and one, the Gross Area measurement standard, applies to all product types and certain leasing situations.

- *Office Buildings: Standard Methods of Measurement (2010)* is intended to measure floor areas in buildings whose occupancy is at least 75% office space, including ground level retail storefronts. It has been designated as an American National Standard by the American National Standards Institute (ANSI) and is referred to as ANSI/BOMA Z65.1-2010.
- *Industrial Buildings: Standard Methods of Measurement (2009)* is intended to measure floor areas in buildings whose occupancy is at least 51% industrial, including warehouses, distribution centers and factories. Developed jointly with the Society of Industrial and Office Realtors (SIOR) and originally published in 2004, it has been designated as an American National Standard by the American National Standards Institute (ANSI) and is referred to as ANSI/BOMA Z65.2-2009.
- *Multi-Unit Residential Buildings: Standard Methods of Measurement (2010)* is targeted at residential buildings containing four or more living units, including apartments and condominiums. It was developed jointly with the Institute of Real Estate Management (IREM), the National Association of Home Builders (NAHB) and the National Multi Housing Council (NMHC), and has been designated as an American National Standard by the American National Standards Institute (ANSI) and is referred to as ANSI/BOMA Z65.4-2010.
- *Retail Buildings: Standard Method of Measurement (2010)* applies to shopping centers, strip shopping centers, big-box stores, and similar retail buildings. It has been designated as an American National Standard by the American National Standards Institute (ANSI) and is referred to as ANSI/BOMA Z65.5-2010.
- *The Gross Areas of a Building: Methods of Measurement (2009)* can be applied to any product type and is often used as a basis for construction cost estimating, some kinds of appraisal and tax assessment. Where an entire building is leased to single tenant, leases are often based upon the gross area of a building. It has been designated as an American National Standard by the American National Standards Institute (ANSI) and is referred to as ANSI/BOMA Z65.3-2009.

The current definition for Area, Building contained in Section 202 is overly broad and can easily result in misinterpretation of the actual area encompassed by each building floor and the total area of the building. The five standards listed for the measurement of floor and building area reference are ANSI standards and provide consistency in determining the measurement of building areas in specific occupancies and multi-use buildings governed by the IBC.

Cost Impact: The proposed changes will **NOT** increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/BOMA Z65.1-10, Z65.2-09, Z65.3—09, Z65.4-10 AND Z65.5-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-AREA, BUILDING-G-BURTON

G3 – 12
202

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Proponent: Jason Thompson (jthompson@ncma.org), National Concrete Masonry Association, Phil Samblanet (psamblanet@masonrysociety.org), The Masonry Society, representing Masonry Alliance for Codes and Standards

Revise definitions in Chapter 2 as follows:

~~**BOND BEAM.** A horizontal grouted element within *masonry* in which reinforcement is embedded.~~

~~**CLEANOUT.** An opening to the bottom of a grout space of sufficient size and spacing to allow the removal of debris.~~

MASONRY. A built-up construction or combination of building units or materials of clay, shale, concrete, glass, gypsum, stone or other *approved* units bonded together with or without *mortar* or grout or other accepted methods of joining.

> ~~**Ashlar masonry.** Masonry composed of various-sized rectangular units having sawed, dressed or squared bed surfaces, properly bonded and laid in *mortar*.~~
>
> ~~**Coursed ashlar.** Ashlar masonry laid in courses of stone of equal height for each course, although different courses shall be permitted to be of varying height.~~
>
> **Glass unit masonry.** Masonry composed of glass units bonded by *mortar*.
>
> **Plain masonry.** Masonry in which the tensile resistance of the masonry is taken into consideration and the effects of stresses in reinforcement are neglected.
>
> ~~**Random ashlar.** Ashlar masonry laid in courses of stone set without continuous *joints* and laid up without drawn patterns. When composed of material cut into modular heights, discontinuous but aligned horizontal *joints* are discernible.~~
>
> **Reinforced masonry.** Masonry construction in which reinforcement acting in conjunction with the masonry is used to resist forces.
>
> **Solid masonry.** Masonry consisting of solid masonry units laid contiguously with the *joints* between the units filled with *mortar*.
>
> **Unreinforced (plain) masonry.** Masonry in which the tensile resistance of masonry is taken into consideration and the resistance of the reinforcing steel, if present, is neglected.

RUBBLE MASONRY. *Masonry* composed of roughly shaped stones.

> ~~**Coursed rubble.** Masonry composed of roughly shaped stones fitting approximately on level beds and well bonded.~~
>
> ~~**Random rubble.** Masonry composed of roughly shaped stones laid without regularity of coursing but well bonded and fitted together to form well-divided *joints*.~~
>
> ~~**Rough or ordinary rubble.** Masonry composed of unsquared field stones~~

~~**SHEAR WALL** (For Chapter 21)~~

~~**Detailed plain masonry shear wall.** A masonry shear wall designed to resist lateral forces neglecting stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**Intermediate prestressed masonry shear wall.** A prestressed masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**Intermediate reinforced masonry shear wall.** A masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**Ordinary plain masonry shear wall.** A masonry shear wall designed to resist lateral forces neglecting stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**Ordinary plain prestressed masonry shear wall.** A prestressed masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**Ordinary reinforced masonry shear wall.** A masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**Special prestressed masonry shear wall.** A prestressed masonry shear wall designed to resist lateral forces considering stresses in reinforcement and designed in accordance with Section 2106.1 except that only grouted, laterally restrained tendons are used.~~

~~**Special reinforced masonry shear wall.** A masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.~~

~~**STACK BOND.** The placement of *masonry units* in a bond pattern is such that head *joints* in successive courses are vertically aligned. For the purpose of this code, requirements for stack bond shall apply to *masonry* laid in other than *running bond*.~~

STONE MASONRY. *Masonry* composed of field, quarried or *cast stone* units bonded by *mortar*.

~~**Ashlar stone masonry.** Stone masonry composed of rectangular units having sawed, dressed or squared bed surfaces and bonded by *mortar*.~~

~~**Rubble stone masonry.** Stone masonry composed of irregular-shaped units bonded by *mortar*.~~

WALL. A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space.

Cavity wall. A wall built of *masonry units* or of concrete, or a combination of these materials, arranged to provide an airspace within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.

~~**Composite wall.** A wall built of a combination of two or more *masonry units* bonded together, one forming the backup and the other forming the facing elements.~~

Dry-stacked, surface-bonded wall. A wall built of concrete *masonry units* where the units are stacked dry, without *mortar* on the bed or *head joints*, and where both sides of the wall are coated with a surface-bonding *mortar*.

~~**Masonry-bonded hollow wall.** A multi-*wythe* wall built of *masonry units* arranged to provide an air space between the *wythes* and with the *wythes* bonded together with *masonry units.*~~

Parapet wall. The part of any wall entirely above the roof line.

Reason: This change proposal deletes masonry-specific terms that are no longer used within Chapter 21 or elsewhere within the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

G3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-BOND BEAM-G-SAMBLANET-THOMPSON

G4 – 12
202

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Proponent: Chuck Bajnai, Chesterfield County, VA., Robert Rice, Josephine County Oregon, representing Oregon Building Officials Association (structdesigner@yahoo.com)

Revise as follows:

BRACED WALL LINE. ~~A series of *braced wall panels* in a single *story* that meets the requirements of Section 2308.3 or 2308.12.4.~~ <u>A straight line through the building plan that represents the location of the lateral resistance provided by the wall bracing.</u>

BRACED WALL PANEL. ~~A section of wall braced in accordance with Section 2308.9.3 or 2308.12.4.~~ <u>A full-height section of wall constructed to resist in-plane shear loads through interaction of framing members, sheathing material and anchors. The panel's length meets the requirements of its particular bracing method, and contributes toward the total amount of bracing required along its *braced wall line* in accordance with Section 2308.6.</u>

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

This proposal clarifies the requirements of both "Braced wall lines" and "Braced wall panels". The proposed definitions are consistent with the definitions in the IRC which reflect the work of ICC's Ad-Hoc Wall Bracing Committee from previous code cycles.

Cost Impact: The proposed changes will not increase the cost of construction.

G4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-BRACED WALL LINE-G-BAJNAI-RICE

G5 – 12
202

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

CEILING RADIATION DAMPER. A *listed* device installed in a ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly to limit *automatically* the radiative heat transfer through an air inlet/outlet opening. <u>Ceiling radiation dampers include air terminal units, ceiling dampers and ceiling air diffusers.</u>

Reason: The added wording specifies the three types of products which provide protection at air inlet/outlet openings.

Cost Impact: The proposed changes will not increase the cost of construction.

G5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CEILING RADIATION DAMPER-G-EUGENE

G6 – 12
202

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

CERAMIC FIBER BLANKET. A high temperature *mineral wool* insulation material made of alumina-silica ceramic or calcium magnesium silicate soluble fibers and weighing 4 to 10 pounds per cubic foot (pcf) (64 to 160 kg/m^3).

Reason: The current IBC definition for ceramic fiber blanket is out of date. Current ceramic fiber technology includes either alumino-silica or calcium magnesium silicate soluble fibers. This definition is referenced in 722.2.1.3.1 and Figure 722.2.1.3.1 which shows thicknesses of *ceramic fiber blankets* to be used generically to insulate joints between precast concrete wall panels for various panel thicknesses and joint widths.

Calcium magnesium silicate fibers have been found to provide equivalent or better performance when tested to numerous Standards referenced in the IBC & IMC, including ASTM E136, ASTM E119, ASTM E814, and ASTM E2336.

Cost Impact: This change will not affect the cost of construction.

G6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CERAMIC FIBER BLANKET-G-CRIMI

G7 – 12
202

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Proponent: Gregg Achman, Hearth & Home Technologies (achmang@hearthnhome.com)

Revise as follows:

[M] CHIMNEY. A primarily vertical ~~enclosure~~ structure containing one or more ~~passageways~~ flues, for ~~conveying flue gases to the outside~~ the purpose of carrying gaseous products of combustion and air from a fuel burning appliance to the outdoor atmosphere.

Factory-built chimney. A *listed* and *labeled chimney* composed of factory-made components, assembled in the field in accordance with manufacturer's instructions and the conditions of the listing.

Masonry chimney. A field-constructed *chimney* composed of solid masonry units, bricks,stones, or concrete.

Metal chimney. A field-constructed *chimney* of metal.

Reason: This provides common language for the definition of a CHIMNEY in the IBC with both the IMC and IFGC.

Cost Impact: The code change proposal will not increase cost of the construction.

G7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CHIMNEY-G-ACHMAN

G8 – 12
202

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov), Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS IS A 4 PART CODE CHANGE PROPOSAL. ALL FOUR PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

PART I – IPC

Revise as follows:

SECTION 202
DEFINITIONS

IPC [B] DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building's* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

PART II – IMC

Revise as follows:

SECTION 202
DEFINITIONS

IMC [B] DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building's* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

PART III – IFGC

Revise as follows:

SECTION 202
DEFINITIONS

IFGC [B] DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building's* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

PART IV – IPSDC

Revise as follows:

SECTION 202
DEFINITIONS

IPSDC [B] DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. <u>In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building's* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).</u>

Reason: This definition is controlled by the IBC; this proposal brings the IPC, IMC, IFGC, and IPSDC, IEBC definitions in line with the term as defined by the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

G8-12
PART I - IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II - IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III - IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV - IPSDC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-P-DESIGN FLOOD ELEVATION-INGARGIOLA-WILSON.doc

G9 – 12
202

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Delete and Substitute as follows:

SECTION 202
DEFINITIONS

~~**EXIT, HORIZONTAL.** A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.~~

<u>**HORIZONTAL EXIT.** An exit component consisting of fire-resistance rated construction and opening protectives intended to compartmentalize portions of a building thereby creating refuge areas that afford safety from the fire and smoke from the area of fire origin.</u>

Reason: This proposed definition clarifies what a horizontal exit actually is. Clearly, it is not a path of egress travel as is currently stated. Contained within the definition of "EXIT," a horizontal exit is classified as an "exit component." Section 1025 provides for the physical construction requirements intended to segregate portions of the building and intended to create refuge areas. The proposed definition more accurately describes the general nature of the horizontal exit and leaves the specifics of the various building configuration and fire-resistance rating options to Section 1025.

Cost Impact: The code change proposal will not increase the cost of construction.

G9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-EXIT, HORIZONTAL-G-KEITH

G10 – 12
202

Proponent: Stephen Kerr, SE, (skerr@jwa-se.com) Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting assemblies consisting of materials or manufactured items assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel reinforcing bars, *masonry units* and wood structural panels, or in accordance with a referenced standard which provides requirements for quality control done under the supervisions of a third-party quality control agency, shall not be considered “fabricated items.”

PREFABRICATED ITEM. A fabricated item.

Reason: Fabricated items can include assemblies of manufactured items such as a truss made of glu-lams, or a wall panel that includes plywood. The new definition of “prefabricated item” is needed so that such items will be subject to the same inspection and special inspection as fabricated items. Examples of the use of the term “prefabricated” in the code include **1703.6 Evaluation and follow-up inspection services**, and **1705.5 Wood Construction**.

Cost Impact: The code change proposal will not increase the cost of construction.

Staff note: While the term ‘prefabricated’ is used in the code, the term ‘prefabricated item’ is not used in the code.

G10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FABRICATED ITEM-G-KERR

G11 – 12
202

Proponent: Tim Nogler, Washington State Building Code Council, representing Washington Association of Building Officials Technical Code Development Committee (time.nogler@des.wa.gov)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Revise as follows:

FIRE SEPARATION DISTANCE. The distance measured from the ~~building face~~ foundation wall or face of the wall framing, whichever is closer, to one of the following:

1. The closest interior *lot line*;
2. To the centerline of a street, an alley or *public way*; or
3. To an imaginary line between two buildings on the property.

The distance shall be measured at right angles from the ~~face of the~~ wall.

Reason: The purpose of this code change proposal is to clarify where the building separation distance measurement is made, increasing consistency in enforcement. The current code states "measured from the building face". The term "building face" is not defined in the code, causing differing interpretations. The fire separation distance measurement is normally verified during the foundation inspection. The nearest face of the foundation stem wall is typically the point from which the building inspector measures. For designs including cantilevered floors, the measurement is derived by review of the plans and calculated based on distance specified from foundation to exterior wall. Either way the building placement commitment occurs at the time the foundation is set. The definition in the code should establish a consistent and uniform location which reflects the actual measurement taken on site.

Cost Impact: The code change proposal will not increase the cost of construction.

G11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIRE SEPARATION DISTANCE-G-NOGLER

G12 – 12
202

Proponent: Gregg Achman, Hearth & Home Technologies (achmang@hearthnhome.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

FIREPLACE. ~~A hearth and fire chamber or similar prepared place in which a fire may be made and which is built in conjunction with a chimney.~~ An assembly consisting of a hearth and fire chamber of noncombustible material and provided with a *chimney*, for use with solid fuels.

> **Factory-built fireplace.** A *listed* and *labeled* fireplace and *chimney* system composed of factory-made components, and assembled in the field in accordance with manufacturer's instructions and the conditions of the listing.
>
> **Masonry fireplace.** A field-constructed fireplace composed of solid masonry units, bricks, stones or concrete.

Reason: This provides common language for the definition of a FIREPLACE in the IBC to that of the IMC and IFGC

Cost Impact: The code change proposal will not increase the cost of construction.

G12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIREPLACE-G-ACHMAN

G13 – 12
202

Proponent: Gene Boecker, Code Consultants, Inc., representing self

Revise as follows:

HIGH-RISE BUILDING. A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access. <u>In determining the lowest level of fire department vehicle access, it shall not be required to consider recessed loading docks for four vehicles or less and conditions where topography makes access from the fire department vehicle to the building impractical or impossible.</u>

Reason: Add to the definition the same exception as is found in exception #5 to Section 905.3.1. Section 905.3.1 provides two reasonable clarifications of how the lowest level of fire department vehicle access should be determined. This should also be applied in this case as part of the definition for a high-rise building. A small loading dock should not be the factor that causes a building to be considered high rise. Nor should a building be considered high rise where the structure is only four stories in height but has one side that overlooks a ravine with a road at the bottom.

Cost Impact: The code change proposal will not increase the cost of construction.

G13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-E-HIGH-RISE-BOECKER (2)

G14 – 12
202

Proponent: Tony Crimi, A.C. Consulting Solutions (tcrimi@smpatico.ca), Gary Hamilton, Hamilton Benchmark; William Koffel, P.E., Koffel Associates; John Valiulis, Hilti, Inc. (john.valiulis@hilti.com), representing Firestop Contractors International Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SECTION 202
DEFINITIONS

JOINT. ~~The opening in or between adjacent assemblies that~~ The junction where adjacent assemblies intersect without applying a static load from one element to another, with or without physical contact between the assemblies, which is created due to building tolerances, or ~~is designed~~ to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

Reason: The definition is revised to clarify that a "joint" is not an opening, per se, but rather is where two independent surfaces intersect, with or without contact, and with or without an obvious opening. For example, if the space between two building elements has been filled with some material (e.g. a backer rod), then it is still a "joint", even though the opening was filled, thus literally leaving no opening.

The definition proposed here is based on the definition of building joint from Wikipedia.org.

Cost Impact: Will not increase the cost of construction.

G14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-JOINT-G-CRIMI-HAMILTON-KOFFEL-VALIULIS.doc

G15 – 12
202

Proponent: William Koffel, P.E., Koffel Associates, representing Firestop Contractors International Association (wkoffel@koffel.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Revise as follows:

JOINT. The opening in or between adjacent assemblies that ~~is~~ interrupts the continuity of a fire-rated or smoke-rated assembly and either involves the intersection of dissimilar materials or assemblies, is created due to building tolerances, or is designed to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

Reason: The test of a fire resistance rated assembly involves testing the joints within the assembly. However, the edges of the assembly are not evaluated in the same manner. Thermocouples are not placed within 12 inches of the edges of the assembly unless an element of the assembly is located only near the edge of the assembly. In addition to the current concept, that a joint is created due to building tolerances or to allow independent movement, an additional situation would also be considered a joint. If a fire resistance rated gypsum wall assembly intersects with a concrete masonry wall assembly, the intersection would now be considered a joint.

Cost Impact: Increased cost of construction where joints are currently not being properly protected

G15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-JOINT-G-KOFFEL

G16 – 12
202

Proponent: Joe Nebbia and Mark Nowak, Steel Framing Alliance

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new definition as follows:

METHODS OF TERMITE PROTECTION. Framing materials such as concrete, treated wood, or steel which remove the food source for termites, or products or services which control the access to and entry of termites into a building or structure.

Reason: Section 2304.11.6 specifies methods of termite protection but provides no guidance for the designer or building official as to what these methods are. There are many different types of approaches used to prevent termite damage in addition to treated wood. This proposal will identify other options currently being used successfully for termite protection.

Cost Impact: This code change proposal will not increase the cost of construction.

G16-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-METHODS OF TERMITE PROTECTION (NEW)-G-NEBBIA-NOWAK

G17 – 12
202

Proponent: Terry L. Amburgey, PhD, AMBAR, Inc., representing A Group of Independent Wood Scientists located in the USA and Canada (terramburgey@yahoo.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

NATURALLY DURABLE WOOD. The heartwood of the following species except for the occasional piece with corner sapwood, provided 90 percent or more of the width of each side on which it occurs is heartwood.

Decay resistant. Redwood, cedar, black locust and black walnut.

Termite resistant. Redwood, Alaska yellow cedar, Eastern red cedar and ~~both heartwood and all sapwood of~~ Western red cedar

Reason: It is well known that the sapwood of virtually all wood species is susceptible to deterioration by fungi and insects such as subterranean termites. However, it should be recognized that the durability of all "naturally durable" woods can be classified as moderately resistant, resistant, or very resistant. In addition, the heartwood durability of a given species may vary according to its position in a tree, so caution should be used when specifying the use of naturally durable wood in lieu of pressure treated wood. We suggest that you reference a readily-available source of literature (e.g., Wood Handbook. "Wood as an Engineering Material", General Technical Report FPL-GTR-113. Forest Products Laboratory, USDA Forest Service) as a source of information on naturally durable (resistant) wood species.

Cost Impact: This code change proposal will not increase the cost of construction.

G17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-NATURALLY DURABLE WOOD-G-AMBURGEY

G18 – 12
202 (NEW)

Proponent: Tony Crimi, A.C. Consulting Solutions, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@smpatico.ca)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Add new definition to Chapter 2 as follows:

SECTION 202
DEFINITIONS

<u>**NONCOMBUSTIBLE MATERIAL.** A material that is not capable of igniting and burning. Materials that meet the acceptance criteria of ASTM E 136 or ASTM E2652 are considered noncombustible materials.</u>

Reason: There is a need for a definition of "noncombustible material" in the IBC. Several of the I-Codes have varying definitions of the term "non-combustible material", each based upon the way in which the concept of "non-combustible" is used within that Code. Throughout the ICC code system, the concept of "noncombustible material" is based on the idea that the material should not ignite or burn when subjected to fire or heat The IBC, which uses the term extensively, does not contain a specific definition.

Justification: The concept of "noncombustible materials" and "noncombustibility" in terms of types of construction is widely used throughout the International Codes. While the IRC, IMC, and IWUIC all contain definitions of the term, they are all different from each other.

In contrast, the IBC, IFC, IEBC and IFGC do not contain a separate definition, even though they use the terminology "non-combustible materials". There is a need for a consistent definition of "noncombustible material" in all ICC codes that use the term.

In common usage, the term "noncombustible" is used to denote materials which do not ignite or are not capable of sustaining combustion. The common Dictionary definitions for "noncombustible" are typically as follows:

> **Noncombustible, adj** – not capable of igniting and burning (Webster's Third New International Dictionary of the English Language, Unabridged, 2007)

In contrast to the common usage, the traditional use of the terminology and concept of "noncombustible materials" in the Codes has been based on acceptable performance when tested in accordance with ASTM E136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C. Materials passing the test are permitted limited flaming and other indications of combustion. However, these have traditional been acceptable. The criterion requiring four specimens to be tested recognizes the variable nature of the measurements and the fact that there are difficulties in observing the presence and duration of flaming.

Understandably, ASTM E136 does not replicate the full spectrum of actual building fire exposure conditions. However, this test method does provide an assessment indicating those materials which do not act to aid combustion or add appreciable heat to an ambient fire. According to the 2009 IBC Commentary, the defined furnace temperature in the standard, 1,382°F (750°C), is representative of temperatures that are known to exist during building fires, although temperatures between 1,800°F (982°C) and 2,200°F (1204°C) are frequently achieved during intense fires. For most building materials, however, complete burning of the combustible fraction will occur as readily at 1,382°F (750°C) as compared to higher temperatures.

While each of the model I-Codes which reference the term "noncombustible" do have unique additional attributes, we are in agreement with the original proponent, that these are best addressed outside of the definition. For example, section 703.4 of the IBC does provide additional requirements and acceptance criteria which are specific to its own intent and contained in Sections 602.2, 602.3, and 602.4. However, this section only describes "Noncombustibility Tests", rather than providing a definition.

Cost Impact: This proposal does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 2652 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012. Note that ASTM E 136 is already referenced in the IBC.

G18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-NON COMBUSTIBLE MATERIAL (NEW)-G-CRIMI

G19 – 12
202

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

PLATFORM. A raised area within a building used for worship, the presentation of music, plays or other entertainment; the head table for special guest; the raised area for lecturers and speakers; boxing and wrestling rings; theater-in-the-round stages; and similar purposes wherein, other than horizontal sliding curtains, there are no overhead hanging curtains, drops, scenery or stage effects other than lighting and sound. A temporary platform is one installed for not more than 30 days.

Reason: The definition is not clear if the overhead curtain is a vertical curtain or does it prohibit horizontal curtains as well.

The commentary states "Thus, since the fuel load on platforms is ordinarily low and there is no fuel load overhead in areas that would be difficult to access, the code requirements for platforms are less stringent than for stages." Thus, it is implied that the definition of overhead hanging curtains is vertical. As such, horizontal curtains are permitted.

Many schools have a raised platform in the cafeteria used for school presentations.
These designs have existed for years with no problems. It should be made more clear in the code that horizontal curtains are permitted.

Cost Impact: This code change proposal will not increase the cost of construction.

G19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-PLATFORM-GODWIN

G20 – 12
202

Proponent: Michael D. Fischer, Kellen Company, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

ROOF RECOVER. ~~The process of installing~~ An alteration consisting of the installation of an additional *roof covering* over a prepared existing *roof covering* without removing the existing *roof covering*.

ROOF REPLACEMENT. ~~The process of removing~~ An alteration consisting of the removal of the existing *roof covering*, repairing any damaged substrate and installing a new *roof covering*.

Reason: This proposal modifies the current definitions for roof recover to clarify that these activities are alterations. This identification is necessary to ensure that all pertinent provisions of Chapter 34 are considered.

Cost Impact: The proposal will not increase the cost of construction.

G20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-ROOF RECOVER-G-FISCHER

G21 – 12
202

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new definition to Chapter 2 as follows:

SHINGLE FASHION. A method of installing roof or wall coverings, water-resistive barriers, flashing, or other building components such that upper or outer layers of material are placed overlapping lower or inner layers of material to provide for drainage and moisture control.

Reason: The purpose of this code change is to introduce a definition for “shingle fashion”. This term is used in the IBC and IRC to describe the required method of applying moisture control layers such as roof underlayment and water-resistive barriers to the building. The intent is to direct the builder, contractor or installer to place upper layers of material lapping over lower layers of material, in the fashion of placing roof shingles, so moisture is provided with a clear path to drain down and away from the building. In field investigations of buildings with mold and moisture issues, it is frequently discovered that flashing, WRBs or underlayment have been placed in ***reverse*** shingle fashion, with the upper layer tucked behind the lower layer. This permits moisture to drain behind or below the intended protective layer or material where it can be trapped and lead to mold and decay of building components. A definition would therefore be of use in giving direction as to the proper installation of these materials.

Cost Impact: The code change proposal will not increase the cost of construction.

G21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-SHINGLE FASHION (NEW)-G-EHRLICH

G22 – 12
202

Proponent: Philip Brazil, P.E., Reid Middletown, Inc., representing Washington Association of Building Officials, Technical Code Development (pbrazil@reidmiddleton.com)

Delete without substitution as follows:

~~**SPECIFIED.** Required by *construction documents*.~~

Reason: Given the use of the term in a multitude of contexts throughout the building code, it is not considered appropriate to define "specified" in such a narrow manner as "required by construction documents." Note that the definition was located in Section 2102 of in the 2009 IBC and the scoping statement in Section 2102.1 specified that all the definitions in Section 2102 are applicable throughout the building code.

Cost Impact: The code change proposal will not increase the cost of construction.

G22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-SPECIFIED-BRAZIL

G23 – 12
202

Proponent: John Ingargiola (john.ingargiola@dhs.gov) and Gregory Wilson (gregory.p.wilson@dhs.gov), representing Department of Homeland Security, Federal Emergency Management Agency, Rebecca C. Quinn, RCQuinn Consulting, Inc. (rcqinn@earthlink.net), representing Department of Homeland Security, Federal Emergency Management Agency

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SUBSTANTIAL IMPROVEMENT. Any *repair*, reconstruction, rehabilitation, alteration, *addition* or other improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or *repair* is started. If the structure has sustained *substantial damage*, any repairs are considered substantial improvement regardless of the actual *repair* work performed. The term does not, however, include either:

1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the *building official* and that ~~are~~ is the minimum necessary to assure safe living conditions.
2. Any *alteration* of a historic structure provided that the *alteration* will not preclude the structure's continued designation as a historic structure.

Reason: The IBC Chapter 34 and the International Existing Building Code are structured to govern repairs, alterations, change of occupancy, and additions. Sections 3404.2, EB403.2 and EB701.3 have requirements for compliance with flood provisions if alterations are determined to be substantial improvement. This proposal does not change any meaning or technical requirement. It simply adds the term "alteration" for consistency with terms used in the code, and adds the word "other" to capture any improvement regardless of what it is called, including those associated with change of occupancy.

Cost Impact: None

G23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-SUBSTANTIAL IMPROVEMENT-G-INGARGIOLA-WILSON-QUINN

G24 – 12
202

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SUBSTANTIAL STRUCTURAL DAMAGE. A condition where:

1. ~~In any *story*, the~~ The vertical elements of the lateral force resisting system have suffered damage such that the lateral load-carrying capacity of ~~the structure~~ any store in any horizontal direction has been reduced by more than 33 percent from its predamage condition; or
2. The capacity of any ~~vertical gravity load-carrying component,~~ vertical component carrying gravity load, or any group of such components, that supports more than 30 percent of the total area of the structure's floors and roofs has been reduced more than 20 percent from its predamage condition and the remaining capacity of such affected elements, with respect to all dead and *live loads,* is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.

Reason: The proposal makes two clarifications to remove potential confusion. Both changes maintain the intent of the current definition.

In item 1, the change clarifies that the potential loss of capacity can be in any story and that the focus on "any story" relates to the capacity loss, not necessarily to the location of the damage.

In item 2, the change clarifies that "vertical" refers to the orientation of the components of interest, not the direction of the gravity loads.

Cost Impact: The proposed changes will not increase the cost of construction.

G24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-SUBSTANTIAL STRUCTURE DAMAGE

G25 – 12

202, Chapter 35

Proponent: Marcelo M. Hirschler, GBH International (gbhint@aol.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SECTION 202
DEFINITIONS

FIRE-RETARDANT TREATED WOOD. A homogeneous wood product, impregnated with chemical by a pressure process or other means during manufacture, which complies with the requirements of ASTM E2768.

TREATED WOOD. Wood and wood-based materials that use vacuum-pressure impregnation processes to enhance fire retardant or preservative properties.

~~**Fire-retardant-treated wood.** Pressure-treated lumber and plywood that exhibit reduced surface-burning characteristics and resist propagation of fire.~~

Preservative-treated wood. Pressure-treated wood products that exhibit reduced susceptibility to damage by fungi, insects or marine borers.

Add new standard to Chapter 35 as follows:

ASTM E2768- 2011	Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)

Reason: ASTM has now issued a test method, ASTM E2768, which contains the three requirements discussed in section 2303.2, namely that a product be tested in accordance with ASTM E84 or UL 723, and exhibit a flame spread index of 25 or less, show no evidence of significant progressive combustion when the test is continued for 30 minutes (i.e. an additional 20-minute period over the standard ASTM E84 duration of 10 minutes) and that the flame front not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

The existing definition of “fire-retardant treated wood” in chapter 2 is inconsistent with the requirements within section 2303.2 in two respects: (a) it can be met by a material that has minimal amount of fire retardant treatment and (b) it requires the fire retardant treatment to be incorporated by a “pressure treatment” and not, as in 2303.2, by a “pressure process or other means during manufacture”. During the 2012 ICC code development process this issue was discussed, in proposal S201 (to the IBC and IRC) and associated comments, and the requirements in 2303.2 were upheld. The definition of fire-retardant treated wood needs to be a stand alone definition that contains the requirements and that is consistent with 2303.2.

Moreover, the addition of the requirement that fire-retardant treated wood must be a “homogeneous” product is necessary to ensure that products that are coated or only partially impregnated with chemicals are not considered “fire-retardant treated wood” as they are not.

Changes in the definition of fire-retardant treated wood need to be made even if no changes are made to section 2303.2, as I recommend in an alternate proposal, because of the inconsistency between the requirements in the definition and those in section 2303.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2768-2011 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIRE RETARDANT TREATED WOOD (NEW)-G-HIRSCHLER.doc

G26 – 12
202

Proponent: Dennis Pitts, American Wood Council (dpits@awc.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

TREATED WOOD. Wood ~~and wood-based materials~~ products that ~~use vacuum-pressure impregnation processes~~ are conditioned to enhance fire retardant or preservative properties.

Fire-retardant-treated wood. ~~Pressure-treated lumber and plywood~~ Wood products that, when impregnated with chemicals by a pressure process or other means during manufacture, exhibit reduced surface-burning characteristics and resist propagation of fire.

Preservative-treated wood. ~~Pressure-treated wood~~ Wood products ~~that~~ , conditioned with chemicals by a pressure process or other means that exhibit reduced susceptibility to damage by fungi, insects or marine borers.

Reason: Pressure-treatment is not the only method permitted by the code for treated wood. Fire retardant treated wood (FRTW) can be impregnated with chemicals by pressure treatment or "other means during manufacture" (see Section 2303.2 and 2303.2.2). Preservative treated wood can be pressure treated or treated by a number of other methods indicated in the AWPA standards referenced in Section 2303.1.8. The current definition assumes pressure-treatment and therefore conflicts with the requirements in the text for both FRTW and preservative-treated wood.

Cost Impact: The code change proposal will not increase the cost of construction. No increase in cost.

G26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIRE RETARDANT TREATED WOOD-G-PITTS

G27 – 12
303.1.4, 305.1.1 (IFC [B] 202)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee

Revise as follows:

303.1.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with *occupant loads* of less than 100 per room or space are not considered separate occupancies.

305.1.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to *places of religious worship* in accordance with Section 303.1.4 and have *occupant loads* of less than 100 per room or space, shall be classified as Group A-3 occupancies.

Reason: This proposal is intended to clarify the application of Sections 303.1.4 and 305.1.1. As currently written it is not clear if the occupant load is intended to be all inclusive, or per room or space. When it is recognized that the language includes "auditoriums" as one of the spaces to consider, an accumulative occupant load would not provide the intended benefit of the language.

The proposed language clarifies that the occupant load of 100 is per room or space, a reasonable number when considering religious educational rooms and auditoriums.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: This proposal will lower the cost of construction by clarifying the intent and application of the language.

G27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.1.4-G-BAJNAI-BCAC

G28 – 12
304.1 (IFC [B] 202)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com**)**

Revise as follows:

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers
Ambulatory care facilities
Animal hospitals, kennels and pounds
Banks
Barber and beauty shops
Car wash
Civic administration
Clinic, outpatient
Dry cleaning and laundries: pick-up and delivery stations and self-service
Educational occupancies for students above the 12th grade
Electronic data processing
<u>Food processing establishments and commercial kitchens with an occupant load less than 25 and not associated with restaurants, cafeterias and similar dining facilities.</u>
Laboratories: testing and research
Motor vehicle showrooms
Post offices
Print shops
Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
Radio and television stations
Telephone exchanges
Training and skill development not within a school or academic program

Reason: It is not uncommon to have catering services, bakeries, takeout pizza, and other food prep establishments in retail strip centers. Calling such uses an F-1 actually invokes change of use provisions that are not necessary. To avoid this, many jurisdictions will just call them "retail sales". However, they actually are more closely related to a small café and should be considered as such. Or, they should be listed under Group M.

With 200 sq. ft. per person occupant load calculation, 25 occupants equates to 5,000 sq. ft.

Cost Impact: This code change proposal will not increase the cost of construction but could reduce the cost of unnecessary change of use.

G28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

304.1-G-GODWIN

G29 – 12
304.1 (IFC [B] 202)

Proponent: Lee J. Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development (lkranz@bellevuewa.gov)

Revise as follows:

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers
Ambulatory health care facilities
Animal hospitals, kennels and pounds
Banks
Barber and beauty shops
Car wash
Civic administration
Clinic-outpatient
Dry cleaning and laundries: pick-up and delivery stations and self-service
Educational occupancies for students above the 12th grade
Electronic data processing
Laboratories: testing and research
Motor vehicle showrooms
Post offices
Print shops
Professional services (architect, attorneys, dentists, physicians, engineers, etc)
Radio and television stations
Telephone exchanges
Training<u>, educational tutoring</u> and skill development not within a school ~~or academic program~~.

Reason: This code change is intended to clarify that educational tutoring centers, such as those typically found in strip malls or office buildings, are considered to be classified as Group "B" occupancies. The term "educational tutoring" is descriptive of the type of use associated with training and skill development outside of a full time K-12 school and are used by students after normal mid-day school hours. It also more specifically and accurately describes the type of moderate occupant load commercial space used to provide focused learning opportunities for individual students.

"Academic program" has been deleted because it broadly describes many different learning situations or teaching methods which would otherwise be considered part of a conventional school environment and has caused many building officials to erroneously classify these uses as Group "E" occupancies.

Many building officials are classifying businesses like Sylvan, Huntington and Kumon Learning Centers as Group "E" occupancies which places the building in a higher risk occupancy category than is necessary to protect the occupants. The student-to-teacher ratio in educational tutoring centers is typically very low and the overall occupant load is moderately low which creates a safer environment similar to a group "B" occupancy.

Cost impact: The code change proposal will increase the cost of construction.

G29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

304.1-G-KRANZ

G30 – 12
304.1 (IFC [B] 202)

Proponent: Adria Paesani, Fountain Valley Fire Department (adria.paesani@fountainvalley.org); Robert Marshall, Contra Costa Fire Department representing CalChiefs

Revise as follows:

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers
Ambulatory health care facilities serving five or fewer patients (see Section 308.3.2 for facilities serving more than five patients)
Animal hospitals, kennels and pounds
Banks
Barber and beauty shops
Car wash
Civic administration
Clinic – outpatient
Dry cleaning and laundries: pick-up and delivery stations and self-service
Educational occupancies for students above the 12th grade
Electronic data processing
Laboratories: testing, research
Motor vehicle showrooms
Post offices
Print shops
Professional services (architects, attorneys, dentists, physicians, engineers, etc)
Radio and television stations
Telephone exchanges
Training and skill development not within a school or academic program <u>(this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics, and similar uses regardless of the ages served, and where not classified as a Group A occupancy)</u>

Reason: The 2012 International Building Code defines a Group E occupancy as *the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade*. There are a variety of local interpretations on whether a tutoring center falls into a Group B or Group E classification. This code proposal is intended to classify tutoring centers and similar transient occupancies that cater to children as Group B occupancies per section 304.1. Enforcing Group E regulations greatly increases the cost to tutoring centers , in particular, as other similar uses clearly do not fall into the academic provisions of the Group E occupancies, i.e. martial arts, gymnastics, etc. The majority of tutoring centers are placed in multi-unit, Type V structures. Placing a Group E occupancy in a Type V building requires either a one-hour or two-hour wall between adjoining occupancies depending on fire sprinkler coverage. In addition, a manual fire alarm system is required in all Group E occupancies having an occupant load of more than 30, unless provided with fire sprinklers.

Cost Impact: The code change proposal will not increase the cost of construction

G30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

304.1-G-PAESANI

G31 – 12

PART I – INTERNATIONAL BUILDING CODE
202, 308.3, 308.3.1, 308.3.2, 308.4.1, 310.6, 310.6.1 (NEW), 310.6.2 (NEW), 420, 420.1, 420.4 (NEW), 420.4.1 (NEW), 504.2, 709.5, 1018.1; (IFC [B] 202, 1018.1)
PART II – INTERNATIONAL FIRE CODE
IFC 903.2.6, 903.2.8.1, 903.2.8.2, 903.2.8.3 (NEW), 903.2.8.3.1 (NEW), 903.2.8.3.2 (NEW), 903.3.1.3, 907.2.6.1; (IBC [F] 420.5, 903.2.6, 903.2.8.1, 903.2.8.2, 903.2.8.3 (NEW), 903.2.8.3.1 (NEW), 903.2.8.3.2 (NEW), 903.3.1.3, 907.2.6.1)

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee

THIS IS A 2 PART CODE CHANGES. BOTH PARTS WILL BE HEARD BY HEARD BY THE IBC GENERAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL COMMITTEE.

PART I – INTERNATIONAL BUILDING CODE

Revise as follows:

SECTION 202
DEFINITIONS

24-HOUR ~~CARE~~ BASIS. The actual time that a person is an occupant within a facility for the purpose of receiving care. It shall not include a facility that is open for 24 hours and is capable of providing care to someone visiting the facility during any segment of the 24 hours**.**

CUSTODIAL CARE. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living. Custodial care ~~include~~ includes occupants ~~who~~ that have the ability to respond to emergency situations and evacuate at a slower rate and/or who have mental and psychiatric complications.

GROUP HOME. A facility for social rehabilitation, substance abuse or mental health problems that contains a group housing arrangement that provides *custodial care* but does not provide ~~acute~~ medical care.

SECTION 308
INSTITUTIONAL GROUP I

308.3 Institutional Group I-1. This occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24 hour basis in a supervised environment and receive *custodial care*. ~~The persons receiving care are capable of self preservation.~~ Buildings of Group I-1 shall be classified as one of the occupancy conditions indicated in Sections 308.3.1 or 308.3.2. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and ~~*custodial*~~ *care* facilities
Social rehabilitation facilities

308.3.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

308.3.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

~~**308.3.2**~~ **308.3.3 Six to sixteen persons receiving custodial care.** A facility ~~such as above,~~ housing not fewer than six and not more than 16 persons receiving ~~such~~ custodial care, shall be classified as Group R-4.

~~**308.3.1**~~ **308.3.4 Five or fewer persons receiving custodial care.** A facility ~~such as the above~~ with five or fewer persons receiving ~~such~~ custodial care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for more than five persons who are *incapable of selfpreservation*. This group shall include, but not be limited to, the following:

Foster care facilities
Detoxification facilities
Hospitals
Nursing homes
Psychiatric hospitals

308.4.1 Five or fewer persons receiving medical care. A facility ~~such as the above~~ with five or fewer persons receiving ~~such~~ medical care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

SECTION 310
RESIDENTIAL GROUP R

310.6 Residential Group R-4. This occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive *custodial care*. ~~The persons receiving care are capable of self-preservation.~~ Buildings of Group R-4 shall be classified as one of the occupancy conditions indicated in Sections 310.6.1 or 310.6.2 This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and ~~custodial~~ care facilities
Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code.

310.6.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, who without any assistance, are capable of responding to an emergency situation to complete building evacuation.

310.6.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

SECTION 420
GROUPS I-1, R-1, R-2, R-3, R-4

420.1 General. Occupancies in Groups I-1, R-1, R-2 ~~and~~ , R-3 and R-4 shall comply with the provisions of Sections 420.1 through ~~420.5~~ 420.6 and other applicable provisions of this code.

420.4 Smoke barriers in Group I-1 Condition 2. Smoke barriers shall be provided in Group I-1 Condition 2 to subdivide every story used by persons receiving care, treatment or sleeping and to provide other stories with an occupant load of 50 or more persons, into no fewer than two smoke compartments. Such stories shall be divided into smoke compartments with an area of not more than 22,500 square feet (2092 m^2) and the travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be in accordance with Section 709.

420.4.1 Refuge area. Refuge areas shall be provided within each smoke compartment. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining smoke compartment. Where a smoke compartment is adjoined by two or more smoke compartments, the minimum area of the refuge area shall accommodate the largest occupant load of the adjoining compartments. The size of the refuge area shall provide the following:

1. Not less than 15 net square feet (1.4 m^2) for each care recipient.
2. Not less than 6 net square feet (0.56 m^2) for other occupants.

Areas or spaces permitted to be included in the calculation of the refuge area are corridors, lounge or dining areas and other low hazard areas.

[F] ~~420.4~~ 420.5 Automatic sprinkler system. *(No change)*

[F] ~~420.5~~ 420.6 Smoke detection and fire alarm system. *(see Part II)*

SECTION 504
BUILDING HEIGHT

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one. These increases are permitted in addition to the *building area* increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one, but shall not exceed 60 feet (18 288 mm) or four *stories*, respectively.

Exception: The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions:

1. Buildings, or portions of buildings, classified as ~~a~~ Group I-1 Condition 2, of Type IIB, III, IV or V construction or Group I-2 ~~occupancy~~ occupancies of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.

SECTION 709
SMOKE BARRIERS

709.5 Openings. Openings in a *smoke barrier* shall be protected in accordance with Section 716.

Exceptions:

1. In Group I-1 Condition 2, Group I-2 and ambulatory care facilities, where doors are installed across *corridors*, a pair of opposite- swinging doors without a center mullion shall be installed having vision panels with fire-protection- rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of 3/4-inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-1 Condition 2, Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 716.

SECTION 1018 (IFC [B] 1018)
CORRIDORS

1018.1 (IFC [B] 1018.1) Construction. *Corridors* shall be fire-resistance rated in accordance with Table 1018.1. The *corridor* walls required to be fire-resistance rated shall comply with Section 708 for *fire partitions*.

Exceptions:

1. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group E where each room that is used for instruction has at least one door opening directly to the exterior and rooms for assembly purposes have at least one-half of the required *means of egress* doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A *fire-resistance rating* is not required for *corridors* contained within a dwelling or sleeping unit in an occupancy in Group I-1 and Group R.
3. A *fire-resistance rating* is not required for *corridors* in *open parking garages*.
4. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group B which is a space requiring only a single *means of egress* complying with Section 1015.1.
5. *Corridors* adjacent to the *exterior walls* of buildings shall be permitted to have unprotected openings on unrated *exterior walls* where unrated walls are permitted by Table 602 and unprotected openings are permitted by Table 705.8.

PART II – INTERNATIONAL FIRE CODE

Revise as follows:

IBC [F] ~~420.5~~ 420.6 ~~Smoke detection and~~ fire alarm systems and smoke alarms. Fire alarm systems and smoke alarms shall be provided in Group I-1, R-1, ~~and~~ R-2 and Group R-4 occupancies in accordance with Sections 907.2.6, 907.2.8, ~~and~~ 907.2.9 and 907.2.10, respectively. Single-or multiple-station smoke alarms shall be provided in Groups I-1, R-2, R-3 and R-4 in accordance with Section 907.2.11.

SECTION 903 (IBC [F] 903)
AUTOMATIC SPRINKLER SYSTEMS

903.2.6 (IBC [F] 903.2.6) Group I. An automatic sprinkler system shall be provided throughout buildings with a Group I fire area.

Exceptions:

1. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1 Condition 1 facilities.
~~2. An automatic sprinkler system installed in accordance with Section 903.3.1.3 shall be allowed in Group I-1 facilities when in compliance with all of the following:~~
~~2.1. A hydraulic design information sign is located on the system riser~~
~~2.2. Exception 1 of Section 903.4 is not applied, and~~
~~2.3. Systems shall be maintained in accordance with the requirements of Section 903.3.1.2.~~
2 ~~3~~. An automatic sprinkler system is not required where Group I-4 day care facilities are at the level of exit discharge and where every room where care is provided has at least one exterior exit door.
3 ~~4~~. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with 903.3.1.1 shall be installed on the entire floor where care is provided and all floors between the level of care and the level of exit discharge, all floors below the level of exit discharge, other than areas classified as an open parking garage.

903.2.8 (IBC [F] 903.2.8) Group R. An *automatic sprinkler system* installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R *fire area*.

903.2.8.1 (IBC [F] 903.2.8.1) Group R-3 ~~or R-4~~ ~~congregate~~ ~~residence~~. An automatic sprinkler system installed in accordance with 903.3.1.3 shall be permitted in Group R-3. ~~or R-4~~ ~~congregate residence with 16 or fewer residents.~~

903.2.8.2 (IBC [F] 903.2.8.2) Group R-4 Condition 1. An automatic sprinkler system installed in accordance with 903.3.1.3 shall be permitted in Group R-4 Condition 1.

903.2.8.3 (IBC [F] 903.2.8.3) Group R-4 Condition 2. An automatic sprinkler system installed in accordance with 903.3.1.2 shall be permitted in Group R-4 Condition 2. Attics shall be protected in accordance with Sections 903.2.8.3.1 or 903.2.8.3.2.

903.2.8.3.1 (IBC [F] 903.2.8.3.1) Attics used for living purposes, storage or fuel fired equipment. Attics used for living purposes, storage or fuel fired equipment shall be protected throughout with automatic sprinkler system installed in accordance with 903.3.1.2.

903.2.8.3.2 (IBC [F] 903.2.8.3.2) Attics not used for living purposes, storage or fuel fired equipment . Attics not used for living purposes, storage or fuel fired equipment shall be protected in accordance with one of the following:

1. Attics protected throughout by a heat detector system arranged to activate the building fire alarm system in accordance with Section 907.2.10.
2. Attics constructed of non-combustible materials.
3. Attics constructed of fire-retardant-treated wood framing complying with Section 2303.2.
4. The automatic fire sprinkler system shall be extended to provide protection throughout the attic space.

~~903.2.8.2~~ 903.2.8.4 (IBC [F] ~~903.2.8.2~~ 903.2.8.4) Care facilities. An automatic sprinkler system installed in accordance with 903.3.1.3 shall be permitted in care facilities with 5 or fewer individuals in a single family dwelling.

903.3.1.3 (IBC [F] 903.3.1.3) NFPA 13D sprinkler systems. Automatic sprinkler systems installed in one and two-family dwellings, Group R-3, ~~and~~ R-4 ~~congregate residences~~ Condition 1 and townhouses shall be permitted to be installed throughout in accordance with NFPA 13D.

SECTION 907 (IBC [F] 907)
FIRE ALARM AND DETECTION SYSTEMS

907.2.6.1 (IBC [F] 907.2.6.1) Group I-1. In Group I-1 occupancies, an automatic smoke detection system shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens. The system shall be activated in accordance with Section 907.5.

Exceptions:

1. For Group I-1 Condition 1 smoke ~~Smoke~~ detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Smoke detection is not required for exterior balconies.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

GENERAL PURPOSE

The current IBC requires all occupants receiving Custodial Care to be able to evacuate on their own without any assistance from others. Most state Custodial Care (assisted living/ residential care/ group homes) licensing agencies allow occupants who require limited assistance with evacuation.[1] The lack of consistency between what the states allow and the IBC Custodial Care provisions causes inconsistent application of the IBC.[2] This proposal resolves that conflict and will result in better consistency. The proposal integrates allowing both residents who require limited assistance with evacuation and those that do not in Custodial Care occupancies. It accomplishes this while maintaining current residential occupancy safeguards along with adding appropriate Group I-2 safeguards, for those requiring assistance with evacuation.

The proposed Group I-1 and R-4 custodial care revisions accomplish the following:

- It provides “condition classifications” for both Groups I-1 and R-4. It makes Condition 1 for the buildings, as currently allowed, with residents capable of responding on their own during emergencies. It adds a Condition 2 for buildings residents who may require some assistance with evacuation.
- The added “condition” classification is already utilized in Group I-3 and is also proposed to be included in Group I-2, under a separate proposal by the ICC Ad Hoc Committee on Healthcare.
- It adds to the new Group I-1 Condition 2, four more stringent requirements due to the new resident type allowed, in addition to the existing current Group I-1 Condition 1 requirements: story limitations, smoke barriers, increased sprinkler protection, and additional smoke detection.
- It adds to the new Group R-4 Condition 2, due to the new resident type allowed, two more stringent requirements in addition to the capable Group R-4 Condition 1 requirements: story limitations, and additional attic detection or protection, considering the smaller facilities.
- It clarifies in the revised Custodial Care definition and in Group I-1 and R-4 Condition 2 occupancies that they are not Group I-2, which provides Medical Care. Group I-1 Custodial Care has persons with some physical or mental limitations, who may require limited assistance in emergency evacuation, but who are still capable enough to participate in complete building evacuation during emergencies. This limit of the level of care or resident type in Group I-1 and R-4 does not include Group I-2 higher acuity occupants who require full nursing care or Medical Care as defined. Those receiving Medical Care in Group I-2 may be bedridden during emergencies, may be on life support systems, or may be semiconscious or unconscious, all in which evacuation concepts allows for defend in place strategies.
- It leaves the other current IBC base I-1/ R-4 requirements, and the capable Group I-1 and R-4 Condition 1 requirements unchanged from the current code, except for minor clerical revisions.
- The substantiation for both the IBC and correlating IFC changes relating to this Group I-1/R4 proposal are integrated below in IBC section order, to provide a comprehensive correlation of both sets of changes for both codes.

GENERAL REASONS AND SUBSTANTIATION

The new Group I-1 Condition 2 requirements add appropriate Group I-2 protection features. It also maintains more restrictive Group I-1 residential protection features than current Group I-2 requirements. Other differences between Group I-1 and Group I-2 are also maintained. The numerous differences between Group I-1/ R-4 Custodial Care and Group I-2 Medical Care occupancies in relation to resident types, care levels, and functional facility design concepts relating to protection noted below, substantiate why it is appropriate to regulate them differently in separate occupancy groups.

- **Group I-1 Condition 2 & Group I-2 similarity:** Group I-1 Condition 2 adds NFPA 13 full sprinkler coverage system requirements, like Group I-2 Medical Care.
- **Group I-1 Condition 2 & Group I-2 similarity & <u>difference:</u>** Group I-1 Condition 2 adds smoke barriers like Group I-2 medical care occupancies. Smoke barriers provide temporary protection for custodial care residents that require assistance from others in an emergency. These Group I-1 facilities still eventually complete building evacuation and residents still participate in fire drills as in the current IFC, versus the "defend in place" and non fire drill participation in Group I-2 Medical Care facilities. The proponent is also proposing minor Group I-1 Condition 2 changes in the IFC, still requiring fire drill participation, and full evacuation, while utilizing smoke compartments to allow for staged building evacuation.
- **Group I-1 Condition 2 & Group I-2 <u>differences:</u>** Group I-1 Condition 2 still has appropriate corridor protections, dwelling and sleeping unit separation, smoke detection, and unit smoke alarms, which Group I-2 Medical Care does not require. This is due to small apartments generally occurring in Custodial Care that may have some domestic cooking appliances, while Group I-2 Medical Care has sleeping rooms where cooking is prohibited in the rooms. It is also due to resident to staff ratios that are generally less in Custodial Care than Group I-2 Medical Care during night time.
- **Group I-1/R-4 Condition 2 & Group I-2 <u>difference:</u>** Group I-1 and R-4 Condition 2 occupancies through state licensing agencies, do not allow residents that must remain in bed during emergency evacuation, so Group I-2 increased means of egress width requirements in Chapter 10 for bed movement are not applied.
- **Group I-1/R-4 Condition 2 & Group I-2 <u>differences:</u>** Other differences between traditional Group I-2 occupancies and new Group I-1 and R-4 Condition 2 occupancies are maintained due to differences between the types of care provided (Medical Care versus Custodial Care), and other characteristics of the two occupancy groups. One example is that Medical Care may have semiconscious or unconscious persons who are totally dependent on others for their safety during emergencies. Custodial Care has persons who are conscious but may not be as functional or responsive to emergencies as compared to the general population. These persons still have sufficient functional ability to participate in evacuation with or without assistance. This aspect of the revised Group I-1 is also consistent with all state assisted living regulations.

These Custodial Care occupancies are also often controlled by individual state licensing agency requirements, which can vary greatly between different states by use, name, and occupant capabilities[2]. This proposal concept clarifies that irrelevant of state licensing regulations, the determining factors for IBC occupancy classification and related safeguards are based on three aspects characterizing the care occupancies:

- **The type of IBC defined care that is provided (Medical or Custodial).** The care level limits Group I-1 to provide Custodial Care and does not allow the higher resident acuity levels allowed in nursing facilities or hospitals (Medical Care).
- **The type of evacuation process and evacuation capability that is allowed in Custodial Care versus Medical Care.** It limits Custodial Care to residents that may require limited assistance in evacuation but who are capable of actively participating in complete building evacuation versus the defend in place concept for Medical Care
- **That they receive care on a 24 hour basis as defined.**

Finally, these concepts proposed herein are already being applied by a majority of the state licensing agencies for custodial care uses, especially in the largest use assisted living/ residential care. State licensing agencies also do control their types of licensed care. All states have nursing licensure and create a line in the sand differentiating nursing licensure from their custodial care licensures. The IBC specifically lists the two uses (nursing and custodial care uses) in separate occupancies, so these proposed changes will not allow for nursing to be in the new Group I-1 Condition 2 occupancy.

<u>ITEMIZED IBC/ IFC SECTION SUBSTANTAITION/ REASONS</u>

The relating substantiation for both the IBC and IFC proposed code changes includes all of the substantiation, in IBC section order, to provide a comprehensive correlation of both sets of changes for both codes.

Section 202 - 24 Hour Basis. The term "24 Hour Basis" revises the old "24 Hour Care" term to reflect the actual term words used throughout the code.

Section 202 - Group Home. The Group Home definition is revised to reflect current defined term of "medical care."

Section 202 - Custodial Care. The revision to the custodial care definition clarifies the difference between custodial care and medical care. Medical care allows for defend in place as is proposed by the ICC Ad Hoc Committee on Healthcare. The revised text clarifies that custodial care includes persons that can still respond to emergencies at a slower rate than the general population for complete building evacuation, due to mental, psychiatric or physical complications.

Section 308.3 Group I-1 is revised to allow persons who can respond to an emergency situation with or without assistance from others. Assisted living is the largest use group of the custodial care uses with over 32,000 facilities. Currently nearly all state licensing agencies allow a majority of their assisted living classifications to have residents that may require limited assistance from others during emergency evacuation. There are also numerous other uses in Group I-1 that have all persons that can evacuation on their own with assistance from others. The "Condition" concept is utilized from the Group I-3 detention occupancy to differentiate Group I-1 occupancies between needing assistance and not needing assistance in evacuation. The "condition" classification is also proposed to be included in Group I-2, under a separate proposal by the ICC Ad Hoc Committee on Healthcare.

The revised section implements language from the existing correlating section in Group I-3, stating that a building shall also be classified with one of the conditions. This clarifies that Group I-1 buildings shall classified on their building permit application and occupancy permit with either a "Group I-1 Condition 1" or "Group I-1 Condition 2" occupancy classification. Most assisted living facilities should be classified as Group I-1 Condition 2 unless the permit application drawings quote licensing regulations limiting the resident type to Condition 1.

The proposed custodial care Condition 2 occupancies include those who may need limited assistance in evacuation. The key aspect of the wording is to differentiate Group I-1 from Group I-2. Group I-1 is limited to custodial care and Group I-2 is for medical care. The intent of using the words "limited verbal or physical assistance" in Group I-1/R-4 Condition 2 is to clarify the difference of capability levels of emergency evacuation between custodial and medical care. Group I-1 Custodial care is limited to those persons needing limited assistance in evacuation but who can still participate in emergency evacuation response and who can still evacuate with or without assistance. Custodial care evacuation assistance is limited versus medical care which includes those who cannot get out of bed during emergencies, or someone completely incapable of helping themselves by being unconscious or semiconscious, or on life support systems.

Many assisted living, residential care, and some group home facilities have some residents that may fall under the following limited assistance with evacuation condition as paraphrased from the NFPA 101A Guide on Alternative Approaches to Life Safety. This guide has been utilized by many states licensing agencies, starting since the early 1990's, to determine the relative emergency evacuation capability of residents of custodial care types of residents, with or without assistance from others. It is used here to show the relative nuances of evacuation assistance that will be included in custodial care in the IBC. The concepts are similar as proposed herein, that the occupants still actively participate in fire drills and are trained to complete building evacuation during emergencies, with or without assistance from others:

- A person who has mild to more resistance or confusion to respond to an alarm, or needing someone to help them with instructions as found with persons with dementia or persons with Alzheimer's.
- A person needing extra intermediate or continuous help during their emergency evacuation.
- A person who has some physical impairment needing physical assistance to help them evacuate.
- A person who needs some assistance getting out of bed or is considered not self starting, but can continue with or without assistance in building evacuation.
- A person with seconds or even a few minutes of impaired consciousness intermittently a few times over a few months due to medications or illness.
- A person requiring minor or constant supervision or attention to help them receive, comprehend, and follow through instructions during emergencies.
- A person who is on medications, or even exceptionally sound sleepers, making them have some chance of not having a waking response to an alarm.
- All persons still have the capability level to participate in emergency evacuation with or without assistance from others.

308.4 Group I-2 is revised with the clerical change clarifying that Group I-2 provides medical care as defined.

Section 310.6 Group R-4 is revised like the Group I-1 to allow persons who can respond to an emergency situation with or without assistance from others for the same reasons cited in the Section 308.3 Group I-1 Reason section.

Section 420.1 Group R-4 is added to the scoping language clarifying that Group R-4 shall conform to Section 420 requirements. The 2012 IBC did not list R-4 in this section even though it was implied that it also had to comply with section 420, because Group R-4 also had to comply with Group R-3 requirements.

Section 420.4 Smoke barriers are added as a requirement in the Group I-1 Condition 2. Smoke barriers are added due to new proposed resident type allowed and to create similar requirements as Group I-2. Compartmentalization is a key aspect of occupancies with occupants who may need assistance with evacuation. There are also state licensing regulations in a majority of states requiring smoke barriers in their assisted living facilities. The smoke barrier sections utilize and match technical requirements, language and format from the current I-2 Section 407 for smoke barriers. The smoke compartment area matches the current area limit.

Section 420.4.1 Matches the format and requirements of the smoke barrier requirements from Section 407. The 15 square feet refuge area is smaller than the Group I-2 refuge area requirements due to no bedridden residents being allowed in custodial care uses by all state regulatory agencies. The 15 square feet matches over the one third of states that have similar state assisted living refuge areas in their licensing life safety regulations compared to this custodial care proposal.

The "sleeping rooms" are also removed as a refuge area space as compared to Group I-2. This is appropriate because custodial care often includes apartments or sleeping rooms that have domestic cooking facilities with the associated room and corridor smoke and fire separation requirements included in Group I-1 and R. This is also another difference between custodial care and medical care.

(IFC) Section 420.5 and 420.6 The current Section "420.4 Automatic sprinkler system" is moved to Section 420.5 as a clerical change due to the new proposed added sections prior. The current Section "420.5 Smoke detection and fire alrm system" is moved to section 420.6 as a clerical change due to the new proposed added sections prior. There are proposed clerical changes to the new section 420.6 that add all of the actual occupancies cross-referenced in the sections referenced in the section.

Section 504.2 requires that the new Group I-1 and R-4 Condition 2 not be allowed to use sprinklers for story increases in Type IIB, III, IV, or V construction, matching the current exception for Group I-2. The limitation is proposed due to the new resident type. It is also because about 30 states licensing agencies already limit their custodial care facilities with residents needing assistance with evacuation to less than the four stories that are currently allowed in Group I-1 in the combustible construction types.

This proposal also essentially matches Oregon's State building code, based on the IBC but with amendments in Groups I-1 and R-4. Oregon's state building code has utilized the specific concepts proposed here in this proposal since 1991. It has the longest history of implementing hybrid Group I and R occupancy requirements by allowing residents needing assistance with evacuation in custodial care, with NFPA 13 sprinklers, smoke barriers, 3 story wood frame limits along with Group R corridor and apartment separation and protections. Oregon has had no multiple fire death fires in over 100 buildings using these concepts and requirements, and all fires were contained.

Section 709.5 includes adding cross corridor doors in the new required smoke barriers in Group I-1 Condition 2, matching the same exceptions allowed for I-2. Adding compartmentalization is a key provision in dealing with occupants that move as individuals or as a group at slower pace, with or without assistance, than the general population during emergency evacuation.

(IFC) Section 903.2.6 requires full NFPA 13 sprinkler coverage in the Group I-1 Condition 2 facility fire areas. The NFPA 13 requirement is added due to the new proposed resident type allowed. Full sprinkler coverage provided by a NFPA 13 system is a key aspect of larger occupancies with residents needing some assistance with evacuation. Currently over half the states licensing agencies already require NFPA 13 sprinklers in their large assisted living facilities with residents needing assistance with evacuation. The exception is revised to allow NFPA 13R in other Group I-1 Condition 1 facilities, maintaining the current exception for the current capable Group I-1 uses.

The exception number 2 is deleted since a NFPA 13D system for single family residential or other small facilities was never intended to be allowed in and Group I-1 facility serving more than 16 residents, irrelevant of whether they require assistance with evacuation.

(IFC) Section 903.2.8.1 is revised to separate the Group R-3 and Group R-4 provisions.

(IFC) Section 903.2.8.2 is added as a clerical revision maintaining the current requirement of sprinklers in accordance with Section 903.3.1.3 in capable Group R-4 which is the new Group R-4 Condition 1.

(IFC) Section 903.2.8.3 is revised to allow for the new R-4 Condition 2 occupancy. The R-4 Condition 2 occupancy would have both an NFPA13R sprinkler system required as well as added attic protection. In attics not used for living purposes, storage or fuel fired equipment, there are four options offered. Either the smoke detection system will provide early warning of an attic fire, or the chance of a fire in the attic is reduced by construction or sprinklers. Automatic sprinklers in the unheated attic space would have a freezing issue in group homes in northern climates, so additional options are necessary.

(IFC) Section 903.3.1.3 Automatic sprinkler system requirement is revised to reflect the proposed changes to the Group R-4 occupancy.

(IFC) Section 907.2.6.1 is revised to eliminate the smoke detection exception only in buildings housing Group I-1 Condition 2 occupancies. This proposal still allows the exception to be applied to other buildings with Group I-1 Condition 1 as defined by fire walls or exterior walls.

Section 1018.1 Corridor Construction is revised to allow halls within dwelling units in Group I-1 be non-rated just like R occupancies as a missed oversight from previous editions of the code.

Footnotes

1. The substantiation of residents needing some assistance with evacuation occurring in assisted living and other custodial care uses was cited in the original G21 proposal for IBC changes during the 2009/10 code change cycle. It substantiated findings from a national analysis on assisted living performed for the State of Hawaii in 2007 titled "Assisted Living Analysis of All State Regulations Relative to Building Codes and Life Safety Codes." It showed that virtually all states allow residents needing limited assistance with evacuation in at least one of their categories of assisted living/ residential care facilities and that about two-thirds of all categories allow this occupant type. The analysis confirmed that assisted living/ residential care facilities receive custodial care (older IBC term personal care) and not medical care, and also confirmed the division of size of facilities in Groups I-1 and R-4, so it is appropriately categorized in the IBC relative to care type and sizes. It substantiated that assisted living/ residential care is the largest and fastest growing use in Groups I-1 and R-4. The analysis also confirmed other various aspects of a custodial care program, uses, and protection features differentiating it from medical (health) care. It presented findings and conclusions that a combination of both Group I and R protection features for custodial care with residents needing some assistance with evacuation as is proposed here, is the consistent to what the largest number of various state licensing agencies have implemented in regulating life safety protection for this use by individual states. It showed that the concepts proposed herein are also consistent or similar to what at least three states have already incorporated into their statewide amendments for the IBC (California, Oregon, and Washington.)

2. Industry representatives confirmed in information provided to the CTC that custodial care and especially assisted living/ residential care IBC occupancy classification varies greatly across the country. Industry substantiated that it is mostly due to the IBC stating that only occupants who can evacuate on their own occur in IBC custodial care occupancies versus what actually occurs nationally. This conflict then causes some custodial care to be classified as a hybrid of Group I-1 and I-2 in states amending the IBC, some classified as Group I-2, some classified as general I-1 or I-2 hybrids in states enforcing other varying standards (NFPA 101), some individual projects applying alternative means creating a hybrid occupancy, and some miss-applying the capability standard. The industry representatives were associated with the American Health Care Association, Assisted Living Federation of America, and Leading Age as the three industry trade associations representing almost all assisted living/ residential care in the country.

Cost Impact: The proposed changes will not increase the cost of construction. Reduction

G31-12
PART I – INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL FIRE CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308-G-BALDASSARRA-CTC (2)

G32 – 12

PART I – INTERNATIONAL BUILDING CODE

202, 308.1, 308.4, 308.7 (NEW), 404.5, 425 (NEW),Table 503, 504.2, Table 509, 710.8, 712.1.8, 713.14.1, 717.5.5, Table 1016.2, Table 1018.1, Table 1018.2, 1018.4, 1107.5.3.1, 3304.8 (NEW), 3311.3 (NEW); (IFC [B] 202, Table 1016.2, Table 1018.1, Table 1018.2, 1018.4)

PART II – INTERNATIONAL FIRE CODE

IFC 903.2.6, 903.3.2, 907.2.6, 907.2.6.2, 907.2.6.4 (NEW), 909.4.6; (IBC [F] 425.5, 425.6, 425.7, 903.2.6, 903.3.2, 907.2.6, 907.2.6.2, 907.2.6.4 (NEW), 909.4.6)

Proponent: Jeff Bresette, FP&C Consultants, Inc.

THIS IS A 2 PART CODE CHANGES. BOTH PARTS WILL BE HEARD BY HEARD BY THE IBC GENERAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL COMMITTEE.

Revise as follows:

SECTION 202
DEFINITIONS

<u>**CARE SUITE**. In Group I-5 occupancies, a group of treatment rooms, care recipient sleeping rooms and the support rooms or spaces and circulation space within the suite where staff are in attendance for supervision of all care recipients within the suite, and the suite is in conformance with the requirements of Section 425.4.2.</u>

CARE SUITE. <u>Within Group I-2 occupancies,</u> a group of treatment rooms, care recipient sleeping rooms and their associated support rooms or spaces and circulation space ~~within Group I-2 occupancies~~ where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.3.

<u>**DEFEND IN PLACE.** A method of emergency response that engages building components and trained staff to provide occupant safety during an emergency. Emergency response involves remaining in place, relocating within the building, or both, without evacuating the building.</u>

Revise as follows:

308.1 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3, ~~or~~ I-4 <u>or I-5</u>.

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for ~~*medical care*~~ <u>*custodial care*</u> on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

Foster care facilities
Detoxification facilities
~~*Hospitals*~~
Nursing homes
~~*Psychiatric hospitals*~~

308.7 Group I-5, Hospitals. This occupancy shall include buildings and structures used for *medical care*, on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

Hospitals and psychiatric hospitals.

Revise as follows:

404.5 Smoke control. A smoke control system shall be installed in accordance with Section 909.

Exception: In other than Groups I-2 and I-5, smoke control is not required for *atriums* that connect only two *stories.*

SECTION 425
GROUP I-5 HOSPITALS AND PSYCHIATRIC HOSPITALS

425.1 General. Occupancies in Group I-5 shall comply with the provisions of Sections 425.1 through 425.9 and other applicable provisions of this code.

425.2 Corridors. *Corridors* in occupancies in Group I-5 shall be continuous to the *exits* and separated from other areas in accordance with Section 424.3 except spaces conforming to Sections 425.2.1 through 425.2.3.

425.2.1 Areas open to corridor unlimited area shall be permitted to be open to a *corridor*, provided there is no treatment, patient sleeping or hazardous areas open to the *corridor* and are constructed as required for *corridors* and where all of the following criteria are met:

1. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
2. The *corridors* onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
3. The space is arranged so as not to obstruct the *exit access* to the required *exits*.

425.2.2 Care providers' stations. Spaces for care providers', supervisory staff, doctors' and nurses' charting, communications and related clerical areas shall be permitted to be open to the *corridor*, when such spaces are constructed as required for *corridors*.

425.2.3 Gift shops. Gift shops and associated storage less than 500 square feet (46.5 m^2) in area shall be permitted to be open to the *corridor* provided the gift shop and storage areas are fully sprinklered and storage areas are protected in accordance with Section 509.4.

425.3 Corridor walls. *Corridor* walls shall be constructed as smoke partitions in accordance with Section 711.

425.3.1 Corridor doors. *Corridor* doors, other than those in a wall required to be rated by Section 509.4 or for the enclosure of a vertical opening or an *exit*, shall not have a required *fire protection rating* and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 716.5.

425.3.2 Locking devices. Locking devices that restrict access to the patient room from the *corridor*, and that are operable only by staff from the *corridor* side, shall not restrict the *means of egress* from the patient room except for patient rooms in mental health facilities.

425.4 Means of egress. Group I-5 occupancies shall be provided with a means of egress complying with Chapter 10 and Sections 407.4.1 through 407.4.3.6.2 and this section. The fire safety and evacuation plans provided in accordance with Section 1001.4 shall identify the building components necessary to support a *defend in place* emergency response in accordance with Sections 404 and 408 and the International Fire Code.

425.4.1 Travel distance. The travel distance between any point in a Group I-5 occupancy sleeping room, not located in a *care suite*, and an *exit access* door in that room shall be not greater than 50 feet (15 240 mm).

425.4.2 Group I-5 care suites. *Care suites* in Group I-5 shall comply with Section 425.4.2.1 through 425.4.2.2 and either Section 425.4.2.3 or 425.4.2.4.

425.4.2.1 Exit access through care suites. *Exit access* from all other portions of a building not classified as a *care suite* shall not pass through a *care suite*. In a *care suite* required to have more than one *exit*, one *exit access* is permitted to pass through an adjacent *care suite* provided all of the other requirements of Sections 425.4 and 1014.2 are satisfied.

425.4.2.2 Separation. *Care suites* shall be separated from other portions of the building by a smoke partition complying with Section 710.

425.4.2.3 Access to Corridor. Movement from habitable rooms shall not require passage through no more than 3 doors and 100 feet (30 480 mm) travel distance within the suite.

Exception: The travel distance shall be permitted to be increased to 125 feet (38 100 mm) where an automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.

425.4.2.4 Care suites containing sleeping room areas. Sleeping rooms shall be permitted to be grouped into *care suites* if one of the following conditions is met:

1. The *care suite* is not used as an *exit access* for more than eight care recipient beds.
2. The arrangement of the *care suite* allows for direct and constant visual supervision into the sleeping rooms by care providers.
3. An automatic smoke detection system is provided in the sleeping rooms and installed in accordance with NFPA 72.

425.4.2.4.1 Area. *Care suites* containing sleeping rooms shall be not greater than 7,500 square feet (696 m^2) in area.

Exception: *Care suites* containing sleeping rooms shall be permitted to be not greater than 10,000 sq feet (929 m^2) in area where an automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.

425.4.2.4.2 Exit access. Any sleeping room, or any *care suite* that contains sleeping rooms, of more than 1,000 square feet (93 m^2) shall have no fewer than two *exit access* doors from the care suite located in accordance with Section 1015.2.

425.4.2.5 Care suites not containing sleeping rooms. Areas not containing sleeping rooms, but only treatment areas and the associated rooms, spaces or circulation space shall be permitted to be grouped into *care suites* and shall conform to the limitations in Section 425.4.2.5.1 and 425.4.2.5.2.

425.4.2.5.1 Area. *Care suites* of rooms, other than sleeping rooms, shall have an area not greater than 10,000 square feet (929 m^2).

425.4.2.5.2 Exit access. *Care suites*, other than sleeping rooms, with an area of more than 2,500 square feet (232 m^2) shall have no fewer than two *exit access* doors from the *care suite* located in accordance with Section 1015.2.

425.4 Smoke barriers. *Smoke barriers* shall be provided to subdivide every *story* used by persons receiving care, treatment or sleeping and to divide other *stories* with an *occupant load* of 50 or more persons, into no fewer than two *smoke compartments*. Such *stories* shall be divided into *smoke compartments* with an area of not more than 22,500 square feet (2,092 m^2) in Group I-2 occupancies and not more than 40,000 square feet in Group I-5 hospitals and the travel distance from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60,960 mm). The *smoke barrier* shall be in accordance with Section 709.

> **Exception:** Atriums provided with smoke control complying with Section 404 are not limited in area for a smoke compartment.

425.4.1 Refuge area. Refuge areas shall be provided within each *smoke* compartment. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining *smoke compartments*. Where a *smoke compartment* is adjoined by two or more *smoke compartments* the minimum area of the refuge area shall accommodate the largest *occupant load* of the adjoining compartments. The size of the refuge area shall provide the following:

1. Not less than 30 net square feet (2.8 m^2) for each care recipient confined to bed or gurney.
2. Not less than 6 square feet (0.6 m^2) for each ambulatory care recipient not confined to bed or gurney and for other occupants.

425.4.2 Independent egress. A *means of egress* shall be provided from each smoke compartment created by *smoke barriers* without having to return through the smoke compartment from which *means of egress* originated.

425.4.3 Horizontal assemblies. *Horizontal assemblies* supporting *smoke barriers* required by this section shall be designed to resist the movement of smoke and shall comply with Section 711.9.

(For Sections 425.5 through 425.7 see Part II)

425.8 Hyperbaric facilities. Hyperbaric facilities in Group I-5 occupancies shall meet the requirements contained in Chapter 20 of NFPA 99.

425.9 Additions. Additions shall be separated from any existing structure, which is not conforming to the provisions for new construction, by fire walls per Table 706.4 or fire barriers per Table 707.3.10 with not less than 2-hour fire resistance construction.

425.10 Elevator Lobbies. Elevator lobbies required by Sections 711.9 and 713.14.1 shall comply with all of the following:

1. Be a minimum of 120 square feet (11.1 m^2) in area.
2. Constructed as required for *smoke partitions* in accordance with Section 710.

Revise as follows:

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of “Area, building,” per story

		TYPE OF CONSTRUCTION								
		TYPE I		**TYPE II**		**TYPE III**		**TYPE IV**	**TYPE V**	
GROUP	**HEIGHT (feet)**	**A**	**B**	**A**	**B**	**A**	**B**	**HT**	**A**	**B**
	STORIES (S) AREA (A)									
I-5	S A	UL UL	4 UL	2 15,000	1 11,000	1 12,000	NP NP	1 12,000	1 9,500	NP NP

(Portions of table not shown remain unchanged)

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one. These increases are permitted in addition to the *building area* increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one, but shall not exceed 60 feet (18 288 mm) or four *stories*, respectively.

Exception: The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions:

1. Buildings, or portions of buildings, classified as a Group I-2 and I-5 ~~occupancy~~ occupancies of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.

TABLE 509
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input.	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cutoff rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, Laboratories and vocational shops, not classified as Group H, ~~located in Group E or I-2 occupancy~~	1 hour or provide automatic sprinkler system
In Group I-2 and I-5 occupancies, laboratories not classified as a Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as a Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system

ROOM OR AREA	SEPARATION AND/OR PROTECTION
In Group I-2 and I-5 occupancies, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 and I-5 patient rooms equipped with padded surfaces	1 hour
In Group I-2 and I-5, physical plant maintenance shops.	1 hour
In Group I-2 and I-5 or ambulatory care facilities, Waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 and I-5, Waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2 and I-5 or ambulatory care facilities, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I, and R occupancies

Revise as follows:

710.8 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an *approved* material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a *smoke damper* complying with Section 717.3.2.2.

Exceptions:

1. Where the installation of a *smoke damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.
2. Smoke dampers shall not be required in duct penetrations of smoke partitions in fully ducted heating, ventilating and air-conditioning systems and the mechanical system will shut down upon detection of smoke and in buildings provided with an *automatic sprinkler system* complying with Sections 903.3.1.1 and 903.3.2.

712.1.8 Two-story openings. In other than Group~~s I-2 and~~ I-3, a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly. 5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section

716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code. Elevator lobbies within Group I-5 occupancies shall comply with Section 425.10

Exceptions:

1. through 7. *(Exceptions not shown remain unchanged)*

717.5.5 Smoke barriers. A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *smoke barrier*. *Smoke dampers* and *smoke damper* actuation methods shall comply with Section 717.3.3.2.

Exceptions:

1. *Smoke dampers* are not required where the openings in ducts are limited to a single *smoke compartment* and the ducts are constructed of steel.
2. Smoke dampers shall not be required in Ambulatory Care Facilities and Groups I-2 and I-5 occupancies where the HVAC is fully ducted in accordance with Section 603 of the International Mechanical Code and where buildings are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and equipped with quick response sprinklers in accordance with Section 903.3.2.

Revise as follows:

TABLE 1016.2 (IFC [B] 1016.2)
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b]
I-1	Not Permitted	250[c]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[c]
H-2	Not Permitted	100[c]
H-3	Not Permitted	150[c]
H-4	Not Permitted	175[c]
H-5	Not Permitted	200[c]
I-2, I-3, I-4, I-5	Not Permitted	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to *exit access* travel distance requirements:
Section 402.8: For the distance limitation in *malls*.
Section 404.9: For the distance limitation through an *atrium* space.
Section 407.4: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
Section 411.4: For the distance limitation in special amusement buildings.
Section 425.3: For the distance limitation in Group I-5.
Section 1015.4: For the distance limitation in refrigeration machinery rooms.
Section 1015.5: For the distance limitation in refrigerated rooms and spaces.
Section 1021.2: For buildings with one *exit*.
Section 1028.7: For increased limitation in assembly seating.
Section 1028.7: For increased limitation for assembly open-air seating.
Section 3103.4: For temporary structures.
Section 3104.9: For pedestrian walkways.
b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.
c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

TABLE 1018.1 (IFC [B] TABLE 1018.1)
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system
I-2[a], I-4, I-5	All	Not permitted	0

(Portions of Table not shown remain unchanged)

TABLE 1018.2 (IFC [B] TABLE 1018.2)
MINIMUM CORRIDOR WIDTH

Occupancy	Width (minimum)
Any facilities not listed below	44 inches
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches
With a required occupancy capacity less than 50	36 inches
Within a dwelling unit	36 inches
In Group E with a *corridor* having a required capacity of 100 or more	72 inches
In *corridors* and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be incapable of *self-preservation*	72 inches
Group I-2 and I-5 in areas where required for bed movement	96 inches

For SI: 1 inch = 25.4 mm.

1018.4 (IFC [B] 1018.4) Dead ends. Where more than one *exit* or *exit access doorway* is required, the *exit access* shall be arranged such that there are no dead ends in *corridors* more than 20 feet (6096 mm) in length.

Exceptions:

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.5), the dead end in a *corridor* shall not exceed 50 feet (15 240 mm).
2. In occupancies in Groups B, E, F, I-1, M, R-1, R-2, R-4, S and U, where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the length of the dead-end *corridors* shall not exceed 50 feet (15 240 mm).
3. A dead-end *corridor* shall not be limited in length where the length of the dead-end *corridor* is less than 2.5 times the least width of the dead-end *corridor*.
4. In occupancies in Group I-5 occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Sections 903.3.1.1 and 903.3.2 the length of the dead-end corridor shall not exceed 30 feet (9 144 mm).

Revise as follows:

1107.5.3 Group I-2 hospitals. *Accessible units* and *Type B units* shall be provided in general-purpose hospitals, psychiatric facilities and detoxification facilities of Group I-2 and Group I-5 occupancies in accordance with Sections 1107.5.3.1 and 1107.5.3.2.

1107.5.3.1 Accessible units. At least 10 percent, but not less than one, of the *dwelling units* and *sleeping units* shall be *Accessible units*.

Exception: Entry doors to Accessible dwelling or sleeping units shall not be required to provide the maneuvering clearance beyond the latch side of the door.

Revise as follows:

3304.8 Group I-5. For buildings employing a *defend in place* method in Group I-5 occupancies, an on-site fire watch shall be provided in accordance with the Section 901.7 of the *International Fire Code*.

3311.3 Group I-5. Temporary construction within corridors serving bed or stretcher movement in Group I-5 occupancies shall not reduce the corridor width to less than 60 inches.

PART II – INTERNATIONAL FIRE CODE

Add new definition as follows:

IBC [F] 425.5 Automatic sprinkler system. Quick-response or residential sprinklers shall be provided in accordance with Section 903.3.2

IBC [F] 425.6 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.6.

IBC [F] 425.7 Automatic fire detection. Group I-5 occupancies shall be equipped with smoke detection as required in Section 425.2.

Revise as follows:

903.2.6 (IBC [F] 903.2.6) Group I. An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exceptions:

1. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1 facilities.
2. An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be allowed in Group I-1 facilities when in compliance with all of the following:
   2.1. A hydraulic design information sign is located on the system riser;
   2.2. Exception 1 of Section 903.4 is not applied; and
   2.3. Systems shall be maintained in accordance with the requirements of Section 903.3.1.2.
3. An *automatic sprinkler system* is not required where day care facilities are at the *level of exit discharge* and where every room where care is provided has at least one exterior exit door.
4. In buildings where Group I-4 day care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided and all floors between the level of care and the level of *exit discharge*, all floors below the *level of exit discharge*, other than areas classified as an open parking garage.
5. In Group I-5 occupancies, an *automatic sprinkler system* is not required in closets less than 6 square feet in area.

903.3.2 (IBC [F] 903.3.2) Quick-response and residential sprinklers. Where *automatic sprinkler systems* are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing care recipient *sleeping units* in Group I-2 in accordance with this code.
2. Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.

3. *Dwelling units* and *sleeping units* in Group I-1 and R occupancies.
4. Light-hazard occupancies as defined in NFPA 13.
5. Group I-5 occupancies.

907.2.6 (IBC [F] 907.2.6) Group I. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2, ~~and~~ 907.2.6.3.3 and 907.2.6.4.

Exceptions:

1. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall not be required at *exits* if located at all care providers' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.4.2.1 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is *approved* by the fire code official.

907.2.6.2 (IBC [F] 907.2.6.2) Group I-2. An automatic smoke detection system shall be installed in *corridors* in nursing homes, long-term care facilities, detoxification facilities and spaces permitted to be open to the *corridors* by Section 407.2. The system shall be activated in accordance with Section 907.5.

Exceptions:

1. Corridor smoke detection is not required in smoke compartments that contain sleeping units where such units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each sleeping unit and shall provide an audible and visual alarm at the care provider station attending each unit.
2. Corridor smoke detection is not required in smoke compartments that contain sleeping units where sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

907.2.6.4 (IBC [F] 907.2.6.4) Group I-5. Hospitals shall be equipped with smoke detection as required in Section 425.

909.4.6 (IBC [F] 909.4.6) Duration of operation. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is ~~less~~ greater.

Reason: Hospitals historically are treated differently than other occupancies based on the need to defend in place during an emergency and that exit corridors are a work area in a hospital setting. This code change recognizes that hospitals are to be treated as a separate and distinct occupancy within the confines of the codes. The basic premise for the change is to remove health care hospitals and psychiatric hospitals from the I-2 umbrella and create a new Group I-5 category. Each of the code changes above have been brought forth by the Ad Hoc Committee for Health Care during the course of 2011, with a few exceptions. Although creating different Conditions of use within a Group I-2 occupancy is one approach, it doesn't recognize the need for separating hospitals into their own occupancy category.

Group I-3 occupancies are defined by different Conditions and are meant for restraint with different levels of securing occupants based on their level of movement capacities, from less secure to more secure. Institutional occupancies have not only different levels of supervision but also different levels of care. The current Group I-2 occupancy category has similar care levels for those that are incapable of self-preservation, but there are historical reasons why hospitals have more restrictive and prescriptive requirements than the other classifications within Group I-2, such as detoxification facilities and nursing homes. Switching hospitals to a separate occupancy is the next logical step in the progression of hospital development for the I-codes.

The scoping classification in Section 308.4 has been revised to reflect that those in nursing home, detoxification facilities, and foster care facilities receive custodial care as defined within the Section 202. Section 308.5 has been added for Group I-5 to reflect the need for medical care, also defined in Section 202.

Section 425 has been created specifically for Group I-5 occupancies. There are some code sections that overlap each of the I-2 and I-5 occupancy classifications and those are reflected above as well. The proposals brought forth by the Ad Hoc Committee for Health Care have been researched thoroughly in 2011 and all reasoning statements are well documented. Based on the work of the Ad Hoc Committee for Health Care, all of these code changes are based on the requirements of external agencies enforcing life safety requirements from the NFPA standards. It is no secret that The Joint Commission has required the use of NFPA 101 for hospitals for decades. For this agency to change from using NFPA 101 to the IBC, drastic changes in the perception of the IBC and ease of its use for hospitals are needed.

Cost Impact: There is no cost impact for these changes as the industry has been using similar guidelines for many years as within the proposed changes through The Joint Commission regulations.

G32-12
PART I – IBC – G

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.4-G-BRESETTE

G33 – 12
202, 308.1.1 (NEW), 408.1, 425 (NEW), Chapter 35

Proponent: Dave Frable, U.S General Services Administration, Public Buildings Service, representing U.S. General Services Administration, Public Buildings Service (dave.frable@gsa.gov)

Revise as follows:

SECTION 202
DEFINITIONS

Lock-Up. An area located in an occupancy, other than an I-3 occupancy, where occupants are detained by the use of security measures not under such occupants' control.

Revise as follows:

SECTION 308
INSTITITUIONAL GROUP I

308.1 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

308.1.1 Lockups. Lockups located in occupancies, other than Group I-3 occupancies, shall comply with the requirements of the main occupancy of the building in which the lockup is located and with the requirements of Section 425.

Revise as follows:

SECTION 408
GROUP I-3

408.1 General. Occupancies in Group I-3 shall comply with the provisions of Sections 408.1 through 408.11 and other applicable provisions of this code (see Section 308.5). Lockups located in occupancies, other than I-3 occupancies, shall comply with the requirements of Section 425.

SECTION 425
LOCKUPS.

425.1 General. Lockups in occupancies, other than Group I-3 occupancies, where the holding area has capacity for more than 50 detainees or where any individual is detained for more than 24 hours, shall be classified as Group I-3 occupancies and shall comply with the requirements of Section 408. Lockups in occupancies, other than Group I-3 occupancies, where the holding area has capacity for not more than 50 detainees, and where no individual is detained for more than 24 hours, shall comply with Section 425.2 or Section 425.3.

425.2 Lockup Option 1. The lockup shall comply with the requirements for the main occupancy of the building in which the lockup is located, and all of the following criteria:

1. Doors and other physical restraints to free egress by detainees can be readily released by staff within 2 minutes of the onset of a fire or similar emergency.
2. Staff is in sufficient proximity to the lockup so as to be able to cause the 2-minute release required by 425.2(1) whenever detainees occupy the lockup.

3. Staff is authorized to cause the release required by 425.2(1).
4. Staff is trained and practiced in effecting the release required by 425.2(1).
5. Where the release required by 425.2(1) is caused by means of remote release, detainees are not to be restrained from evacuating without the assistance of others.

425.2.1 Fire department notification. The fire department with responsibility for responding to a building that contains a lockup shall be notified of the presence of the lockup.

425.3 Lockup Option 2. Where the lockup does not comply with all the provisions of Section 425.2 the requirements of this Section shall be met.

425.3.1 Main occupancy. The requirements applicable to the main occupancy of the building in which the lockup is located shall be met.

425.3.2 Means of egress. Where security operations necessitate the locking of required means of egress, the following shall apply:

1. Detention-grade hardware meeting the requirements of ASTM F 1577 shall be provided on swinging doors within the required means of egress.
2. Sliding doors within the required means of egress shall be designed and engineered for detention and correctional use, and lock cylinders shall meet the cylinder test requirements of ASTM F 1577.

425.3.3 Smoke detection. The lockup shall be provided with a smoke detection system in accordance with Section 907.4.3.

425.3.4 Fire alarm system. Where the requirements applicable to the main occupancy of the building do not mandate a fire alarm system, the lockup shall be provided with a fire alarm system meeting all of the following criteria:

1. The fire alarm system shall be installed in accordance with Section 907.6.
2. Initiation of the fire alarm system shall be accomplished by all of the following:
   2.1. Manual fire alarm boxes in accordance with Section 907.4.2
   2.2. Smoke detection system in accordance with Section 425.3.3
   2.3. Automatic sprinkler system required by the provisions applicable to the main occupancy of the building.
3. Staff and occupant notification shall be provided automatically in accordance with Section 907.5.
4. Emergency force notification shall be provided in accordance with Section 907.6.5.

425.3.5 Fire department notification. The fire department with responsibility for responding to a building that contains a lockup shall be notified of the presence of the lockup.

Add new definition to Chapter 35 as follows:

ASTM – F 1577-05 Standard Test Methods for Detention Locks for Swinging Doors

Reason: The intent of this code change proposal is to address the subject matter of 'lockups". A lockup is basically a holding area in which persons are detained with some degree of security imposed on them that are commonly located in different types of occupancies. For example, lockups are typically located in immigration and naturalization facilities at border crossings, customs facilities at international airports, prisoner holding facilities at courthouses, local police department holding areas, security offices at sports stadia, security offices at shopping mall complexes, etc. Currently, the requirements within the IBC require "lockups" to meet the rigorous defend in place requirements applicable for Group I-3 occupancies. This code change proposal provides requirements specifically for lockups located in other than Group I-3 occupancies and provide a reasonable set of safe guards applicable to the main occupancy of the building in which the lockup is located. The subject provisions for lockups are meant to apply to holding areas of limited capacity in which no individual is detained for 24 or more hours.

New Section 425.1 establishes that if the holding area has the capacity for more than 50 detainees, it is classified as Group I-3 occupancy. Similarly, new Section 425.2 requires that, if an individual is detained for 24 or more hours, the holding area must be classified as Group I-3 occupancy.

Lockups subject to the provisions in Sections 425.3 are offered two options of compliance. Option #1 in Section 425.2 requires a system of safeguards, so that doors and physical restraints to free egress by detainees can be readily released by trained staff with the authority to cause such release, within 2 minutes of the onset of a fire or similar emergency. Option #1 will apply to holding areas that either (1) are staffed at all times when detainees are present or (2) have staff in close proximity and the detection and notification technology needed to summon such trained staff immediately upon the onset of an emergency. Option #2 provides alternate provisions for when all the criteria of the 2-minute release option in compliance Option #1 cannot be satisfied. This alternate set of provisions relies heavily on the presence of complete smoke detection within the lockup and its use to summon trained staff and emergency forces via the fire alarm system, which is required even if otherwise exempted for the main occupancy of the building. In addition, if the Code provisions applicable to the main occupancy of the building require sprinkler protection, the water flow in the sprinkler system must initiate the required alarm system. This option also imposes requirements for detention-grade doors hardware to address any reliability concerns by referencing ASTM F 1577-05, Standard Test Methods for Detention Locks for Swinging Doors. The subject standard's test methods will help ensure that detention locks perform at acceptable levels to control passage to unauthorized or secure areas, to confine detainees, and to delay escape attempts.

Please note that the subject code change proposal is based on the requirements for lockups in the National Fire Protection Association, Life Safety Code (2012 edition).

Cost Impact: This code change will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 1577-05 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-LOCK UP (NEW)-G-FRABLE.doc

G34 – 12
308.3, 310.6

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee

Revise as follows:

308.3 Institutional Group I-1. This occupancy shall include buildings, structures or portions thereof for more than 16 persons who reside on a 24 hour basis in a supervised environment and receive *custodial care*. The persons receiving care are capable of self preservation. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
~~Convalescent facilities~~
Group homes
Halfway houses
Residential board and *custodial care* facilities
Social rehabilitation facilities

310.6 Residential Group R-4. This occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive *custodial care*. The persons receiving care are capable of self-preservation. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
~~Convalescent facilities~~
Group homes
Halfway houses
Residential board and *custodial care* facilities
Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code.

Reason: This term is outdated and should be deleted from Group I-1. The term 'convalescent home' is being currently being incorrectly used in IMC Table 403.3 as a Group I-2 facility. There is a correlative proposal to delete the term from IMC Table 403.3.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: The proposed changes will not increase the cost of construction.

G34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.3-G-BALDASSARRA-CTC

G35 – 12
202, 308.3, 308.4 (IFC [B] 202)

Proponent: Jerry Rosendahl, President, National Association of State Fire Marshals (jerry.rosendahl@state.mn.us)

Revise as follows:

308.3 Institutional Group I-1. This occupancy shall include buildings, structures or portions thereof for more than 16 persons who reside on a 24 hour basis in a supervised environment and receive *custodial care*. The persons receiving care are capable of self preservation. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities with residents capable of self preservation
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and *custodial care* facilities
Social rehabilitation facilities

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for more than five persons who are *incapable of self preservation*. This group shall include, but not be limited to, the following:

Foster care facilities
Detoxification facilities
Hospitals
Nursing homes
Psychiatric hospitals
Assisted living facilities with residents incapable of self preservation

Revise as follows:

ASSISTED LIVING FACILITIES. Custodial care congregate residential settings that provide or coordinate personal and health care services, 24-hour supervision, and assistance (scheduled and unscheduled) for the *health care maintenance* of adults who are aged, infirm or disabled and who are cared for in a primarily residential setting.

HEALTH CARE MAINTENANCE. The protection, general supervision and oversight of the physical and mental well-being of an aged, infirm or disabled individual. Residents may or may not need assistance to evacuate.

CUSTODIAL CARE. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living. Custodial care includes occupants who evacuate at a slower rate and/or who have mental and psychiatric complications~~.~~ and may be incapable of self preservation.

Reason: The current code language limits I-2 to only medical care facilities, which in itself would be in conflict with foster child care facilities. There are many facilities housing residents incapable of self-preservation that are not medical facilities by state definitions. This represents a huge gap in the code. With I-2 as a classification for only those facilities providing medical care and I-1 for only those capable of self-preservation, the IBC has no classification for a facility in which residents are under the care, supervision, protection or under the responsible care of the facility operator, and who are not capable of self-preservation. We do not object to what the CTC committee is attempting to do, but the CTC should recognize that the code certainly should be clear about the protection required for all individuals who are under the care of others and develop provisions that will protect all individuals. In order to make the proper distinction and close the code's gap, the definition of "assisted living facilities" is offered. The phrase "health care maintenance" appears only in the definition of "assisted living facilities".

Cost Impact: The code change proposal will not increase the cost of construction.

G35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-ASSISTED LIVING FACILITIES (NEW)-G-ROSENDAHL

G36 – 12
308.3.1, 308.4.1, 310.5.1(IFC [B] 202)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Betsy Lease, representing Brown County Partnership

Revise as follows:

SECTION 308
INSTITUTIONAL GROUP I

308.3.1 Five or fewer persons receiving care. A facility such as the above with five or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the *International Residential Code*. ~~provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.~~

308.4.1 Five or fewer persons receiving care. A facility such as the above with five or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the *International Residential Code*. ~~provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.~~

SECTION 310
RESIDENTIAL GROUP R

310.5.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code*. ~~provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.~~

Reason: The purpose of this proposal is to let the IRC determine if a sprinkler system is required in what it typically a single family home. The sprinkler system should not be 'hidden' within the IBC for homes constructed under the IRC. It is discriminatory to require only these homes to have sprinkler systems if the state has decided to not require sprinklers under IRC.

I am Chairman of a community-wide accessibility committee that works with and supports organizations that helps people with disabilities, often with limited mobility live in home in their community. These individuals may be temporarily physically disabled, or permanently disabled, or even in hospice. We advocate for them get custodial care and medical care on a regular basis – anywhere from a visit per day to a live-in helper. When it is a long term situation, we assist people to make modifications to their home to accommodate the care needs, or the client may choose to build a new home with what is commonly called a 'mother-in-law's suite' or nursery. Some of the officials I have talked to say this requirement is only for where home care is a business, but the text is not written that way. Therefore, this could be applicable to any home where one person needs custodial care or medical care. Was the intent was to apply this to foster care, or if someone I am taking care of in my home is not related? It is discriminatory under Fair Housing Act to define 'family' by blood or marriage. In addition, I am not aware of a state that licenses facilities with 5 or fewer residents.

Cost Impact: The proposed changes will not increase the cost of construction.

G36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.3.1-G-LEASE

G37 – 12
202, 308.5, 308.5.6 (NEW) (IFC [B] 202)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee

Revise as follows:

308.5 Institutional Group I-3. This occupancy shall include buildings and structures that are inhabited by more than five persons who are under restraint or security. An I-3 facility is occupied by persons who are generally *incapable of selfpreservation* due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

Correctional centers
Detention centers
Jails
Lockup facility
Prerelease centers
Prisons
Reformatories

Buildings of Group I-3 shall be classified as one of the occupancy conditions indicated in Sections 308.5.1 through 308.5.5 (see Section 408.1).

308.5.6 Lockup facilities. A *lockup facility* for five or less persons shall be classified as a Group B occupancy or as part of the primary occupancy provided they comply with the following provisions**:**

1. The area containing a lockup facility shall be separated from other rooms, spaces or areas by approved smoke barrier complying with Section 709.
2. The area containing a lockup facility shall be protected with an automatic fire sprinkler system complying with Section 903.
3. The area containing a lockup facility shall be provided with an automatic smoke detection system installed in accordance with Section 907.

Ad new definition as follows:

SECTION 202
DEFINITIONS

LOCKUP FACILITY. Buildings containing holding cells, rooms or areas where occupants are restrained or detained.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Part 1 of this code proposal is the revision of Section 308.5 and the addition of Section 308.5.6. The revision removes more than five persons, and adds buildings and structures containing a room, holding cell or cellblock used to place persons under restraint or security. The new section adds lockup facilities and also clarifies that an approved smoke barrier complying with Section 709 be provided, and also fire sprinkler and smoke detectors be installed.

Part 2 of this code proposal adds a definition for lockup facilities that is needed in the Code that clarifies the use occupancies for buildings/spaces that contain five or less occupants under restraint or detained.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: This proposal will increase the cost of construction of rooms or spaces used to restrain or detain occupants.

G37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.2-G-BAJNAI-BCAC

G38 – 12
202, 310.3, 310.4 (IFC [B] 202)

Proponent: Dana Peterson, University of New Hampshire, representing APPA.ORG - Leadership in Education

Revise as follows:

SECTION 310
RESIDENTIAL GROUP R

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code*.

310.3 Residential Group R-1. Residential occupancies containing *sleeping units* where the occupants are primarily *transient* in nature, including:

Boarding houses (*transient*) with more than 10 occupants
Congregate living facilities (*transient)* with more than 10 occupants
<u>Dormitories (transient)</u>
Hotels (*transient*)
Motels (*transient*)
<u>Vacation timeshare properties (transient)</u>

310.4 Residential Group R-2. Residential occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (nontransient) with more than 16 occupants
Congregate living facilities (nontransient) with more than16 occupants
Convents
Dormitories/<u>Student residence facilities (nontransient)</u>
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Vacation timeshare properties<u> (nontransient)</u>

Revise as follows:

SECTION 202
DEFINITIONS

DORMITORY. A ~~space in a~~ building <u>or space within </u>where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management<u>.</u>~~, as in college dormitories or fraternity houses.~~

DWELLING UNIT. A single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking, and sanitation.

SLEEPING UNIT. A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both <u>or a unit of sleeping accommodations in a building where provisions for living, sleeping, and sanitation are provided</u>

communally, and provisions for eating and cooking are either provided communally or permitted. Such rooms and spaces that are also part of a *dwelling unit* are not sleeping units.

TRANSIENT. Occupancy of a *dwelling unit* or *sleeping unit* for a short term temporary basis, typically not more than 30 days.

Reason: The purpose of the proposed change is to clarify the classification of the Residential Group R occupancy types especially as it applies to student residence facilities, formerly commonly referred to, and sometimes still referred to as dormitories. Currently, dormitories are listed as R-2 occupancies which we feel is a correct designation for today's student residence facilities. However, the definition provided for a dormitory suggests a student lifestyle and building type of a bygone day. Today's residence halls are anything but formulaic. Many are a mix of apartments, suites, double-doubles, and single occupant rooms. These kinds of facilities make for interesting architectural arrangements of space and complex interior floor plans that don't always have intuitively obvious exit routes. Cooking facilities, both in individual rooms and communal kitchens, as well as food service facilities, are becoming increasingly more common if not the norm. A trend toward "Living and Learning" has created buildings that have increasing amounts of assembly space within them. Classrooms, recreation facilities, and movie/concert/dance venues are all becoming commonplace in newer facilities.

That said, there are still buildings that are akin to the old-style dormitory, such as summer camps, hostels, homeless shelters, bunkhouses, and barracks, and the code should have a classification to recognize those facilities too. So our proposal recognizes dormitories as a potential R-1 occupancy as well and judges the difference the same way as all other R-1 occupancies are judged, by the transient or nontransient nature of the occupants. Although it is not central to our purpose, we also took this opportunity to suggest that vacation timeshare properties also be located to the R-1 occupancy for the same reason and so that the logic for classification based upon the familiarity with the building remains consistent.

The proposal also specifically designates that nontransient student residence facilities are an R-2 occupancy, removing the necessity for the "dormitory" definition to do double duty to both describe the defining features and give all-encompassing examples. It also slightly modifies the definition of "transient" to put the emphasis on the defining characteristic of short term occupancy, with "30 days" given more as a guidepost than an absolute.

APPA is also seeking this strengthening and clarification for the occupancy classification of student residence facilities under IBC in support of its ongoing efforts with the National Fire Prevention Association to facilitate a change in that code to classify student residence facilities with apartment buildings or in a separate chapter, rather than with hotels as they do currently. Adoption of our proposal would clarify IBC's position that APPA is in concurrence with and strengthen APPA's argument for consistency in NFPA's view of the same issue.

Cost Impact: The proposed changes will not increase the cost of construction.

G38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

310.1-G-PETERSON

G39 – 12

310.4 (IFC [B] 202)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Wesley Walters, Clark County Development Services

Revise as follows:

310.4 Residential Group R-2 Residential occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (nontransient) with more than 16 occupants
Condominiums (nontransient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Vacation timeshare properties

Reason: Condominiums are a part of any towns' makeup of housing types and they are not defined within the code. Without condominiums added in the decision becomes, are they apartments that are individually owned, or townhouses that may not have handicap access. Without classifying this type of residence there will not be consistent interpolations of where they belong in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

G39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

310.4-G-WALTERS

G40 – 12
202, 310.5, 310.5.2 (NEW), IPC Table 403.1 (IBC [P] Table 2902.1)

Proponent: Tim Nogler, Washington State Building Code Council, representing Washington Association of Building Officials Technical Code Development Committee (tim.nogler@des.wa.gov)

Revise as follows:

310.5 Residential Group R-3. Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*
Boarding houses (nontransient) with 16 or fewer occupants
Boarding houses (*transient*) with 10 or fewer occupants
Care facilities that provide accommodations for five or fewer persons receiving care
Congregate living facilities (nontransient) with 16 or fewer occupants
Congregate living facilities (*transient*) with 10 or fewer occupants
Lodging houses with five of fewer *guest rooms*

310.5.2 Lodging houses. Owner occupied *lodging houses* with five or fewer *guest rooms* shall be permitted to be constructed in accordance with the *International Residential Code.*

Add new definitions as follows:

SECTION 202
DEFINITIONS

GUEST ROOM. A room used or intended to be used by one or more guests for living or sleeping purposes.

LODGING HOUSE. A one family dwelling where one or more occupants are primarily permanent in nature, and rent is paid for guestrooms.

Revise as follows:

IPC TABLE 403.1 (IBC [P] TABLE 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See IPC Sections 403.2 and 403.3)
(See IBC Sections 2902.2 and 2902.3)

No.	Classification	Occupancy	Description	WATER CLOSETS (Urinals see section 419.2 of the IPC)		LAVATORIES		BATHTUBS/SHOWERS	Drinking Fountains[e,f] (See Section 410.1 of the IPC)	OTHER
				MALE	FEMALE	MALE	FEMALE			
7	**Residential**	R-3	One-and two-family dwellings and lodging houses with 5 or fewer guest rooms	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	--	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit

(Portions of table not shown remain unchanged)

Reason: The purpose of this code change is to allow a small bed and breakfast or similar lodging to be classified as single family. The proposed definitions are from the 2012 IRC. This proposal makes the IBC consistent with the IRC in regulating "lodging houses". The 2012 IRC scope covers lodging house occupancies with five or fewer guestrooms, when equipped with a fire sprinkler system. In the previous cycle, the IBC General committee had concerns that adding the IRC definitions to the IBC would create conflict with chapter 29 required plumbing fixtures. The committee had concerns that a new Group R-3 occupancy would create confusion with how to determine minimum number of plumbing fixtures per chapter 29. To address that concern, this proposal adds "lodging house" to IPC Table 403.1 (IBC Table 2902.1) to be consistent with one-family dwellings.

Cost Impact: This code change proposal will not increase the cost of construction.

G40-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

310.5-NOGLER

G41 – 12
310.5, 310.5.2(NEW) (IFC [B] 202)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee

Revise as follows:

310.5 Residential Group R-3. Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*
Boarding houses (nontransient) with 16 or fewer occupants
Boarding houses (*transient*) with 10 or fewer occupants
Care facilities that provide accommodations for five or fewer persons receiving care
Congregate living facilities (nontransient) with 16 or fewer occupants
Congregate living facilities (*transient*) with 10 or fewer occupants
<u>Owner-occupied lodging houses (transient) with 16 or fewer occupants</u>

310.5.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

<u>**310.5.2 Owner occupied lodging houses**. Owner-occupied lodging houses with ten or fewer occupants shall be permitted to be constructed in accordance with the International Residential Code where equipped throughout with an automatic sprinkler system in accordance with Section P2904 of the International Residential Code.</u>

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The purpose of this code change is to provide correlation between the International Residential Code and the International Building Code. During the previous code cycle provisions allowing the construction under the IRC for owner-occupied lodging houses for five or fewer guestrooms were approved. This proposal adds owner-occupied lodging houses to the list of R-3 Occupancy and provides a pointer to the IRC when the number of occupants falls to ten or fewer.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: This proposal will decrease the cost of construction by clarifying the relationship between the IRC and the IBC.

G41-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

310.5-G-BAJNAI-BCAC

G42 – 12
311.1.2 (NEW) (IFC [B] 202)

Proponent: Tod Connors, Arlington County (VA) Department of Community Planning, Housing, and Development/Division of Inspection Services, representing self

Revise as follows:

311.1.2 Accessory storage spaces. A room or space used for storage purposes that is less than 100 square feet (9.3m$^{2)}$ in area and accessory to another occupancy will be classified as part of that occupancy. The aggregate area of such rooms or spaces shall not exceed the allowable area limits of Section 508.2.

Reason: Storage rooms were removed from Incidental Uses, Table 509. Storage is now treated as a mixed use condition and must meet either the requirements of 508.2 Accessory occupancies, 508.3 Nonseparated occupancies, or 508.4 Separated occupancies. When applying these mixed use sections in B occupancy buildings of IIB or IIA construction, an S-I storage room cannot be placed on the highest floor allowed by Table 503 Allowable Building Heights and Areas and Section 504 Building Height. The 100 square foot lower limit would allow small storage rooms on upper floors. This area is the same lower limit used in the Incidental Use Table when storage rooms were last included. The statement limiting area to the limits under current Accessory occupancy requirements is to preclude a large number of small storage rooms in excess of what other code sections limit.

Cost Impact: The code change proposal will not increase the cost of construction.

G42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

311.1.2 (NEW)-G-CONNORS

G43 – 12
202, 402.1, 402.1.1

Proponent: David S. Collins, The Preview Group, Inc. (dcollins@preview-group.com)

Revise as follows:

ANCHOR BUILDING. An exterior perimeter building of a group ~~other than H~~ having direct access to a *covered or open mall building* but having required *means of egress* independent of the mall.

~~COVERED~~ MALL BUILDING. A ~~single~~ *building* enclosing a number of tenants ~~and~~ , of different ~~occupants,~~ occupaniests ~~such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices and other similar uses wherein two or more tenants have a main entrance into one or more malls. *Anchor buildings* shall not be considered as a part of the covered mall building. The term "covered mall building" shall include *open mall buildings* as defined below.~~

~~**Mall.** A roofed or covered common pedestrian area within a *covered mall building* that serves as access for two or more tenants and not to exceed three levels that are open to each other. The term "mall" shall include open malls as defined below.~~

~~**Open mall.** An unroofed common pedestrian way serving a number of tenants not exceeding three levels. Circulation at levels above grade shall be permitted to include open exterior balconies leading to *exits* discharging at grade.~~

~~**Open mall building.** Several structures housing a number of tenants, such as retail stores, drinking and dining establishments, entertainment and amusement facilities, offices, and other similar uses, wherein two or more tenants have a main entrance into one or more open malls. *Anchor buildings* are not considered as a part of the open mall building.~~

Revise as follows:

402.1 Applicability. The provisions of this section shall apply to mall buildings or structures ~~defined herein as~~ that are *covered,* ~~*or*~~ *open* or a combination of covered and open *mall buildings* ~~not exceeding three floor levels at any point nor more than three *stories above grade plane*. Except as specifically required by this section, *covered and open mall buildings* shall meet applicable provisions of this code.~~ Mall buildings shall include buildings with multiple tenants of varying occupancies, anchor buildings and parking garages. Group H occupancies shall not be permitted in mall buildings or anchor buildings.

~~**Exceptions:**~~

1. ~~Foyers and lobbies of Groups B, R-1 and R-2 are not required to comply with this section.~~
2. ~~Buildings need not comply with the provisions of this section where they totally comply with other applicable provisions of this code.~~

402.1.1 Open space. ~~A~~ C*overed mall building* ~~and attached~~, *anchor buildings* and parking garages shall be surrounded on all sides by a permanent open space or not less than 60 feet (18 288 mm). ~~An *open mall building* and *anchor buildings* and parking garages adjoining the perimeter line shall be surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm).~~

Exception: The permanent open space of 60 feet (18 288 mm) shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the *covered or open mall building* and *anchor buildings;*

2. The *exterior wall* facing the reduced open space shall have a *fire-resistance rating* of not less than 3 hours;
3. Openings in the *exterior wall* facing the reduced open space shall have opening protectives with a *fire protection rating* of not less than 3 hours; and
4. Group E, ~~H,~~ I or R occupancies are not located within the *covered or open mall building* or *anchor buildings*.

Reason: The definition of Anchor Building and Covered Mall Building includes various technical requirements that are contradictory and should be a part of the requirements in Section 402, not a definition.

The definition Covered Mall Building includes commentary language that is not comprehensive and should not be a part of the code. The use or storage of hazardous materials had been an occupancy that was prohibited from being a part of a covered mall building and has been specifically stated by this change. The prohibition on the H occupancy is included in the definition of anchor buildings. Defining elements of the building that are uniquely part of the requirements of the code should not be hidden in the definition.

By including open mall building as part of the definition of covered malls, the single building provisions are incorrect. Why the provisions for multiple buildings on a single lot can't be considered a covered mall building isn't clear. Other conditions of a series of buildings that include both enclosed and open "mall" features isn't addressed leaving open questions in the code, simply because of the definitions.

Cost Impact: The increased understanding of what this section is addressing will significantly reduce the cost of design and review.

G43-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

402.1-G-COLLINS

G44 – 12
402.4.1

Proponent: David S. Collins, The Preview Group, Inc. (dcollins@preview-group.com)

Revise as follows:

402.4.1 Area and types of construction. The *building area* of any *covered mall or open building*, including *anchor buildings*, of Types I, II, III and IV construction shall not be limited provided the ~~*anchor*~~ *buildings* do not exceed three *stories above grade plane*.

~~The construction type of *open parking garages* and enclosed parking garages shall comply with Sections 406.5 and 406.6, respectively.~~

> ~~**Exception:**~~ The type of construction ~~allowable *building height* and *building area*~~ of *anchor buildings* greater than three *stories above grade plane* shall comply with Section 503, as modified by Sections 504 and 506.

Reason: As written the section makes no sense and is impossible to design for or to enforce. Section 402.4.1 references an open building;" there is nothing in the code that describes an "open building." We believe what was intended was an "open mall building." Secondly, the prescription that the mall can be unlimited as long as the anchor building doesn't exceed three stories would allow an unlimited height mall, but limit the anchor building to three stories.

Similarly the reference to Section 406 for open and enclosed parking garages is unnecessary as it is simply a pointer to the limits for parking garages. Nothing in the code would prohibit a parking garage from being a part of the mall building and not be limited by 406.

Finally, the exception for anchor buildings is poorly written and is not an exception to any of the previous stated requirements. What the section is trying to say is that the type of construction for an anchor building over three stories in height must meet be met by the height and area limits of 503, with the open perimeter and fire suppression allowances. By removing the unnecessary words "allowable building height and building area," the sentence is rational. 402.4.1 simply states that if they are three stories or less, they are allowed to be unlimited in area.

By these changes it would be clear that all malls can be unlimited in area if all parts of it, including the anchor building are not more than three stories in height. Similarly, garages are allowed as part of the mall. Several sections indicate how the anchor building or garage are to be treated if they are not part of the mall meeting the three story limit.

Cost Impact: The increased understanding of what this section is addressing will significantly reduce the cost of design and review.

G44-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

402.4.1-G-COLLINS

G45 – 12
402.4.1, 402.4.1.1 (NEW), 402.4.1.2 (NEW), 402.4.1.3 (NEW)

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

402.4.1 Area and types of construction. The *building area* and type of construction of ~~any~~ *covered mall or open mall buildings*, ~~including~~ *anchor buildings*, ~~of Types I, II, III and IV construction shall not be limited provided the *anchor buildings* do not exceed three *stories above grade plane*. The construction type of *open parking garages* and enclosed parking garages shall comply with Sections 406.5 and 406.6, respectively.~~ and parking garages shall comply with this section.

> ~~**Exception:** The type of construction allowable *building height* and *building area* of *anchor buildings* greater than three *stories above grade plane* shall comply with Section 503, as modified by Sections 504 and 506.~~

402.4.1.1 Covered and open mall buildings. The building area of any covered mall or open mall building shall not be limited provided the covered mall or open mall building does not exceed three floor levels at any point nor three stories above grade plane, and is of Type I, II, III or IV construction.

402.4.1.2 Anchor buildings. The building area and building height of any anchor building shall be based upon the type of construction as required by Section 503, as modified by Sections 504 and 506.

> **Exception:** The building area of any anchor building-shall not be limited provided the anchor building is not more than three stories above grade plane, and is of Type I, II, III or IV construction.

402.4.1.3 Parking garage. The building area and building height of any parking garage, open or enclosed, shall be based upon the type of construction as required by Sections 406.5 and 406.6, respectively.

Reason: The proposed change seeks to add clarity to what have always been somewhat confusing limits and requirements for types of construction for mall buildings and their attached structures (anchor buildings and parking garages) by breaking a single code section into multiple sections. No technical changes are proposed.

A regional shopping center is typically by code comprised of 3 components; a covered or open mall, an anchor building(s), and a parking garage(s). And when it comes to building area and type of construction requirements in the IBC, each of these components has a unique set of criteria. Currently the IBC has the building area and type of construction regulations for all 3 of these components in a single section, which makes it confusing when trying to distinguish which provision applies to which component.

This proposal seeks to break the content of current Section 402.4.1 into 3 subsections – one for the mall building itself (402.4.1.1), one for anchor buildings (402.4.1.2)and one for parking garages (402.4.1.3).

When broken down, the building area and type of construction requirements for mall buildings, anchor buildings and parking garages are very clear.

Cost Impact: The proposed changes will not increase the cost of construction.

G45-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

402.4.1-G-RICE

G46 – 12
402.6.4.1

Proponent: Richard Crawford, Mercer Sign Consultants, representing United States Sign Council (rcmercer@verizon.net)

Delete without substitution as follows:

~~**402.6.4.1 Area.** Plastic signs shall be not more than 20 percent of the wall area facing the *mall*.~~

Reason: The existing Code provision is has no rational basis. The sign industry can find no practical, engineering or public safety reason to limit Wall sign size to 20 % of a Wall inside a Mall. Signs inside malls do not experience wind load stresses or damage from external elements. The value originally inserted in the Appendix H 402.15.1 was arbitrary and was not supported by direct research or practical sign fabrication experience. The size of a wall sign with a plastic face installed inside a mall is properly within the jurisdiction of the property owner, the sign owner, and any applicable local codes. There is no practical percentage value to substitute, and deletion is recommended. For example, a small storefront may often warrant a sign area that comprises a larger percentage overall (larger than 20%), but this size may be insignificant compared to other tenant signs in the mall. These matters are more appropriately addressed between landlord and tenant.

Cost Impact: The code change proposal will not increase the cost of construction.

G46-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

402.15.1-G-CRAWFORD

G47 – 12
402.6.4.2

Proponent: Richard Crawford, Mercer Sign Consultants, representing United States Sign Council (rcmercer@verizon.net)

Delete without substitution as follows:

~~**402.6.4.2 Height and width.** Plastic signs shall be not greater than 36 inches (914 mm) in height, except that if the sign is vertical, the height shall be not greater than 96 inches (2438 mm) and the width shall be not greater than 36 inches (914 mm).~~

Reason: The existing Code provision is overly restrictive. The sign industry can find no practical, engineering or public safety reason to limit the height of tenant wall signs inside a Mall to 36" in height, nor then paradoxically allow a vertical height of 96" if the width is no more than 36". Signs inside malls do not experience wind load stresses or damage from external elements. The value originally inserted in the Appendix H 402.15.2 was arbitrary and was not supported by direct research or practical sign fabrication experience. The size of a wall sign with a plastic face installed inside a mall is properly within the jurisdiction of the property owner, the sign owner, and any applicable local codes. Many existing and planned sign installations inside Malls may not comply with this provision.

Cost Impact: The code change proposal will not increase the cost of construction.

G47-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

402.15.2-G-CRAWFORD

G48 – 12
403.1

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering, (al.godwin@aon.com)

Revise as follows:

403.1 Applicability. *High-rise buildings* shall comply with Sections 403.2 through 403.6.

> **Exception:** The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:
>
> 1. Airport traffic control towers in accordance with Section 412.3.
> 2. *Open parking garages* in accordance with Section 406.5.
> 3. ~~Buildings with~~ The portion of a building containing a Group A-5 occupancy in accordance with Section 303.6. This exemption shall not apply to other uses that if on their own would have been considered as a high-rise building.
> 4. Special industrial occupancies in accordance with Section 503.1.1.
> 5. Buildings with a Group H-1, H-2 or H-3 occupancy in accordance with Section 415.

Reason: As written, the wording exempts any building as long as part of the building is a Group A-5. If built as one building, it could be read to exempt high-rise office and/or condo's that are connected to or part of a sports stadium.

The commentary states:

> "Places of outdoor assembly (Group A-5) and stand alone open parking garages are exempted because of the free ventilation to the outside that exists in such structures,"

Many stadiums today, including at the college level, are built with uses such as sky boxes and restaurants that themselves qualify as a high rise. While exempting the open air stadium seems appropriate since its occupants can see everything, other uses should be protected as a high rise if any of those uses on their own exceed the high rise limitation.

Individuals in sky boxes do not have a clear vision of neighboring skyboxes. Exiting a sky box is not as simple as walking out into the open air seating and moving away from the hazard.

Cost Impact: This code change will increase the cost of construction if such other uses have been allowed to be exempt from high-rise provisions and are now required to comply.

G48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403#1-G-GODWIN

G49 – 12
403.1

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering, (al.godwin@aon.com)

Revise as follows:

403.1 Applicability. *High-rise buildings* shall comply with Sections 403.2 through 403.6.

Exception: The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.3.
2. *Open parking garages* in accordance with Section 406.5.
3. Buildings with a Group A-5 occupancy in accordance with Section 303.6. 4. Special industrial occupancies in accordance with Section 503.1.1.
5. Buildings with:
   5.1. a Group H-1 occupancy; ~~,~~
   5.2. a Group H-2 occupancy in accordance with Sections 415.7.1, 415.8.1, 415.8.3 and 415.8.4;
   or ~~,~~
   5.3. a Group H-3 occupancy in accordance with Section 415.7.1

Reason: The commentary states:

"Finally, buildings with occupancies in groups H-1, H-2 and H-3 are excluded from the provisions of this section because the fire hazard characteristics of such occupancies in a high-rise have not yet been considered."

However, the code does not prohibit these H occupancies from being in high-rise buildings. If that is the intent, then there are many sections of the code that need amending.

Are Group H occupancies allowed in high-rise buildings?

If not, this code change needs to go a different direction.

It is not uncommon to have Group H-2, flammable liquids, in a high rise building. And, high-rise labs often have H-2 flammable gases and H-3 oxidizing gases as well.

In accordance with Section 508.2.4, 508.3.3 and 415.8.2.1, specific H occupancies are required to be separated as separated mixed uses in accordance with Section 508.4. These Group H occupancies are not to be considered Accessory uses or non-separated mixed uses. They must always be separated mixed uses.

To exempt the entire building from high-rise provisions for complying with Section 415 does not seem reasonable since the provisions of that section do not compensate for the high rise provisions.

As listed, any high rise lab building that has a flammable gas H-2 room would be exempt from all of the high-rise provisions, including the fire service access elevator.

For example:
Section 415.8.2 provides provisions for the storage, handling, processing and transporting of flammable and combustible liquids in Groups H-2 and H-3 occupancies. There is a short list of requirements. However, compliance with that short list does not seem to compensate for the high-rise provisions of Section 403.

It does seem appropriate to exempt the occupancies only for the new sections listed. As proposed in this code change, only the following buildings would be exempt from the high rise provisions.

H-1 – required to be in a separate building and only allowed one story, Section 415.6.
H-2 and H-3 – when required to be in a separate building and only allowed one story, Section 415.7.
H-2 – special buildings:
Combustible dusts, grain processing and storage, Section 415.8.1
Liquefied petroleum gas facilities, Section 415.8.3.
Dry cleaning plants, Section 415.8.4.

Cost Impact: This code change proposal will not increase the cost of construction.

G49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403#2-G-GODWIN

G50 – 12
403.1, 403.1.1 (NEW)

Proponent: Kevin L. Derr, P.E., DVR Consulting LLC, representing self

Revise as follows:

403.1 Applicability. *High-rise buildings* shall comply with Sections 403.2 through 403.6.

> **Exception:** The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:
>
> 1. Airport traffic control towers in accordance with Section 412.3.
> 2. *Open parking garages* in accordance with Section 406.5.
> 3. Buildings with a Group A-5 occupancy in accordance with Section 303.6.
> 4. Special industrial occupancies in accordance with Section 503.1.1.
> 5. Buildings with ~~a~~ <u>of</u> Group H-1, H-2 or H-3 ~~occupancy~~ <u>occupancies</u> in accordance with Section 415.

<u>**403.1.1 Prohibited Use Groups.** Mixed-use high-rise buildings with Group A, B, E, F, H-4, H-5, I, M, R, S or U occupancies shall not have a Group H-1, H-2 or H-3 occupancy located within the building or structure.</u>

Reason: As indicated in the International Building Code Commentary, the fire risk associated with H-1, H-2 and H-3 occupancies have not yet been considered in a high-rise context. Sections of Section 415 and Chapter 5 of the IBC permit buildings or structure with H-1, H-2, or H-3 occupancy in excess of 75 feet above fire department vehicle access. As such there is a minor contradiction between the Commentary and specific provisions of the code. It is assumed that the intent of exception 5 is to prohibit Group H-1, H-2, and H-3 occupancies from being part of a "typical" high-rise building that would normally consists of residential, educational, business and other similar occupancies. However, the 2012 edition of the code states that buildings with a H-1, H-2, or H-3 occupancy do not have to comply with the provisions of Section 403.2 through 403.6.This is an issue because the provisions of Section 403.2 through 403.6 have been provided to address the increase risk associated with the tall structures and to aid in firefighting response. As written, a high-rise mixed use building with a H-3 occupancy located within the building can be built without the enhanced protection of increased structural integrity for exit enclosures and elevators (403.2.3), increased SFRM bond strength (403.2.4), improved fire suppression reliability (403.3), etc… The exception will allow architecture/engineers and builders an ability to circumvent code provisions specifically put in place to address the risk associated with tall building. This is not the intent of exception 5. The proposed change corrects the issue by prohibiting H-1, H-2 and H-3 occupancies from being located in a high-rise building with any of the other occupancies while allowing H occupancies to be built over 75 feet where permitted by Section 415 and Chapter 5.

Cost Impact: The proposal will not increase the cost of construction

G50-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.1-G-DERR

G51 – 12

403.2.1.2, Table 716.5, 3412.6.6 (IEBC [B] 1401.6.6)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Proponent: Philip Brazil. PE, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development (pbrazil@reidmiddleton.com)

Revise as follows:

403.2.1.2 Shaft enclosures. For buildings not greater than 420 feet (128 000 mm) in *building height*, the required *fire-resistance rating* of the *fire barriers* enclosing vertical *shafts,* other than ~~*exit enclosures*~~ *interior exit stairway* and elevator hoistway enclosures, is permitted to be reduced to 1 hour where automatic sprinklers are installed within the *shafts* at the top and at alternate floor levels.

Revise as follows:

TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4 3 2 1-1/2	3 3[a] 1-1/2 1-1/2
~~Shaft,~~ Enclosures for shafts, ~~exit enclosures~~ interior exit stairways and interior exit ramps: and exit passageway walls	2	1-1/2
Fire barriers having a required fire-resistance rating of 1-hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways~~,~~ and interior exit ramps; and exit passageway walls	1	1
Other fire barriers	1	3/4
Fire partitions: Corridor walls	1 0.5	1/3[b] 1/3[b]
Other fire partitions	1 0.5	3/4 1/3
Exterior walls	3 2 1	1-1/2 1-1/2 3/4
Smoke barriers	1	1/3 [b]

(Portions of Table not shown remain unchanged)

Revise as follows:

3412.6.6 (IEBC [B] 1401.6.6) Vertical openings. Evaluate the *fire-resistance rating* of ~~*exit* enclosures~~ *interior exit stairways or ramps*, hoistways, escalator openings and other shaft enclosures within the building, and openings between two or more floors. Table 3412.6.6(1) contains the appropriate protection values. Multiply that value by the construction type factor found in Table 3412.6.6(2). Enter the vertical opening value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.6, Vertical Openings, for fire safety, means of egress, and general safety. If the structure is a one-story building or if all the unenclosed vertical openings within the building conform to the requirements of Section 708, enter a value of 2. The maximum positive value for this requirement shall be 2.

Reason: The changes are for consistency with the approved changes from Proposal E5-09/10, which changed instances of "exit enclosure" to "interior exit stairway or ramp." A reference to "ramp" is not added to Section 403.2.1.2 for consistency with Section 403 on high rise buildings, which generally does not specify ramps with interior exit stairways (e.g., Sections 403.2.3, 403.2.3.1, 403.2.3.2, 403.5.1 and 403.5.2). All instances of "exit enclosure" in the 2012 IBC are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

G51-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.2.1.2-G-BRAZIL

G52 – 12
403.5.2, 403.5.4

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Proponent: Philip Brazil. PE, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development (pbrazil@reidmiddleton.com)

Revise as follows:

403.5.2 Additional <u>interior</u> exit stairway. For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in *building height*, one additional *<u>interior</u> exit stairway* meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of *exits* required by Section 1021.1. The total width of any combination of remaining *<u>interior</u> exit stairways* with one *<u>interior</u> exit stairway* removed shall be not less than the total width required by Section 1005.1. *Scissor stairs* shall not be considered the additional *<u>interior</u> exit stairway* required by this section.

> **Exception:** An additional *<u>interior</u> exit stairway* shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.

403.5.4 Smokeproof enclosures. Every required *<u>interior</u> exit stairway* serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall be a *smokeproof enclosure* in accordance with Sections 909.20 and 1022.10.

Reason: "Interior" is added before "exit stairway" because "exit stairway" includes exterior exit stairways, which are not permitted in high-rise buildings by Section 1026.2. Based on our analysis of the 2012 IBC, all instances of "exit stairway" in provisions for or related to high-rise buildings, where a change to "interior exit stairways" is warranted, are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

G52-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.5.2-G-BRAZIL

G53 – 12
403.6.1

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, no fewer than two fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with Section 3007. Each fire service access elevator shall have a capacity of not less than 3500 pounds (1588 kg) <u>and shall comply with Section 3002.4</u>.

Reason: When Section 3002.4 was amended to require elevator cars that can accommodate an 84 inch (2134 mm) stretcher it increased the size of the elevator car to a 3500 pound minimum capacity. As Section 403.6.1 now requires all Fire Service Access elevators in a building to be this size, it makes sense to coordinate this requirement with the stretcher size requirement.

As firefighters use Fire Service Access elevators to stage to fight a fire, these elevators will often be occupied carrying equipment and personnel to the staging floor. If only one of these 3500 pound elevators can also accommodate a stretcher, there is no guarantee that it will be the one that is available to evacuate injured persons. Having all Fire Service Access elevators usable and available to serve both the staging and the evacuation functions is an efficient way of taking advantage of what may be the largest elevator cars in the building.

Cost Impact: This code change proposal will not increase the cost of construction.

G53-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.6.1-G-BLACK

G54– 12
404.5, 712.1.8

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare and Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

404.5 Smoke control. ~~A~~ In other than Group I-2. smoke control system shall be installed in accordance with Section 909.

Exception: Smoke control is not required for *atriums* that connect only two *stories*.

712.1.8 Two-story openings. In other than ~~Groups I-2 and~~ Group I-3, a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx This proposal is being co-sponsored by the ICC Code Technology Committee.

This proposal is intended to correct a misapplication of the intent of the code and coordinate with federal requirements. Currently the language in Section 404.5 and 404.6 would allow a two story atrium to be open to the floors without providing a smoke control system or any passive separation. While this may be appropriate for many occupancy groups, exposing patients who are incapable of self preservation to a large vertical opening is an unacceptable risk. Practically, this would never occur because federal requirements that fund and regulate these types of facilities would not allow an opening without either smoke control or passive separation.

Two story vertical openings are design features that hospitals typically employ to create a more calming and welcoming environment for the patients and their families. The intent of the code appears to allow multiple methods for dealing vertical openings. The AHC believed that a reasonable solution was to restrict the unprotected atrium language and concurrently add language to allow the use of two story openings in 712.1.8. This trade off would protect the corridor from the large opening between floors. It would also provide facilities and designers two options for dealing with these openings.

Cost Impact: The code change proposal will increase the cost of construction.

G54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.5-G-Williams-AdHocHealthcare

G55 – 12
404.5

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

404.5 Smoke control. ~~A~~ In other than Group I-2 and Group I-1. Condition 2, smoke control system shall be installed in accordance with Section 909.

Exception: Smoke control is not required for *atriums* that connect only two *stories*.

Reason: The Adhoc Healthcare committee has a proposal to require smoke control for 2 story atriums in Group I-2 due to concerns about smoke compartmentation. The CTC care committee would like to include the new Group I-1, Condition 2 based on the same theory of protection.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: The proposed changes will not increase the cost of construction.

G55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.5-G-BALDASSARRA-CTC

G56 – 12
404.5

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

404.5 Smoke control. A smoke control system shall be installed in accordance with Section 909.

Exception<ins>s</ins>:

1. <ins>A</ins> smoke control <ins>system</ins> is not required for *atriums* that connect only two *stories*.
2. <ins>A smoke control system is not required for atriums connecting more than two stories when all of the following are met:</ins>
   - <ins>2.1. Only the 2 lowest stories shall be permitted to be open to the atrium. Unprotected openings shall be permitted.</ins>
   - <ins>2.2. All stories above the lowest 2 stories must be separated from the atrium in accordance with Section 404.6.</ins>
   - <ins>2.3 No operable openings shall be allowed in the walls of the atrium above the lowest 2 stories.</ins>

Reason: As stated in Section 909, the purpose of a smoke control systems is to provide a tenable environment for the evacuation or relocation of occupants. A smoke control system is NOT intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems that are required and regulated by the IBC serve a different purpose than the smoke- and heat-venting provisions found in Section 910 and they are not considered exhaust systems under Chapter 5 of the International Mechanical Code.

In an atrium that connects more than 2 stories, the smoke control systems is intended to maintained the height of the lowest horizontal surface of the smoke layer interface to at least 6 feet above any walking surface that forms a portion of a required egress system within the smoke zone for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

But what if the only walking surfaces in the atrium are on the 2 lowest stories of the atrium? What if all the walls above the 2 lowest stories are solid without operable openings? What purpose does the smoke control system then serve? We contend none. And if the smoke control system has no real value, then why install it?

This proposed change seeks to make exempt atriums that may connect more than 2 stories but which do not have any walking surfaces above the 2 lowest stories of the atrium when the walls of the atrium above the 2 lowest stories do not have any operable openings.

Cost Impact: The proposed changes will not increase the cost of construction. The cost of construction would be reduced by this proposal.

G56-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.5-G-RICEE

G57 – 12

202, 404.9, 410.6.3.2, [F] 411.4 (IFC 914.7.1), 1007.6 (IFC [B] 1007.6), 1015.4 (IFC [B] 1015.4), 1015.5 (IFC [B] 1015.5), Table 1021.2(2) [IFC [B] Table 1021.2(2)], Table 3412.6.5 (IEBC [B] Table 1401.6.5), C104.1

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Proponent: Philip Brazil. PE, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development (pbrazil@reidmiddleton.com)

Revise as follows:

SECTION 202
DEFINITIONS

COMMON PATH OF EGRESS TRAVEL. That portion of *exit access* which the occupants are required to traverse before two separate and distinct paths of egress travel to two *exits* are available. Paths that merge are common paths of travel. Common paths of egress travel shall be included within the permitted exit access travel distance.

404.9 Exit access travel distance. In other than the lowest level of the *atrium*, where the required *means of egress* is through the *atrium* space, the portion of *exit access* travel distance within the *atrium* space shall be not greater than 200 feet (60 960 mm). The exit access travel distance requirements for areas of buildings open to the *atrium* and where access to the *exits* is not through the *atrium*, shall comply with the requirements of Section 1016.

410.6.3.2 Exit access travel distance. The ~~length of~~ *exit access* travel distance shall be not greater than 300 feet (91 440 mm) for buildings without a sprinkler system and 400 feet (121 900 mm) for buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

[F] 411.4 (IFC 914.7) Automatic sprinkler system. *Special amusement buildings* shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Where the *special amusement building* is temporary, the sprinkler water supply shall be of an *approved* temporary means.

> **Exception:** Automatic sprinklers are not required where the total floor area of a temporary *special amusement building* is less than 1,000 square feet (93 m^2) and the exit access travel distance from any point to an *exit* is less than 50 feet (15 240 mm).

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required *area of refuge* shall be *accessible* from the space it serves by an *accessible means of egress*. The maximum travel distance from any *accessible* space to an *area of refuge* shall not exceed the exit access travel distance permitted for the occupancy in accordance with Section 1016.1. Every required *area of refuge* shall have direct access to a *stairway* complying with Sections 1007.3 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an *area of refuge*, the shaft and lobby shall comply with Section 1022.10 for smokeproof enclosures except where the elevators are in an *area of refuge* formed by a *horizontal exit* or smoke barrier.

1015.4 (IFC [B] 1015.4) Refrigeration machinery rooms. Machinery rooms larger than 1,000 square feet (93 m_2) shall have not less than two *exits* or *exit access doorways*. Where two *exit access doorways* are required, one such doorway is permitted to be served by a fixed ladder or an *alternating tread device*. *Exit access doorways* shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway*. An increase in exit access travel distance is permitted in accordance with Section 1016.1.

Doors shall swing in the direction of egress travel, regardless of the *occupant load* served. Doors shall be tight fitting and self-closing.

1015.5 (IFC [B] 1015.5) Refrigerated rooms or spaces. Rooms or spaces having a floor area larger than 1,000 square feet (93 m^2), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two *exits* or *exit access doorways*.

Exit access Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway* where such rooms are not protected by an *approved automatic sprinkler* system. Egress is allowed through adjoining refrigerated rooms or spaces.

> **Exception:** Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *International Mechanical Code*.

TABLE 1021.2(2) [IFC [B] TABLE 1021.2(2)]
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANTS PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story or basement	A, B [b], E, F [b], M, U, S [b]	49 occupants	75 feet
	H-2, H-3	3 occupants	25 feet
	H-4, H-5, I, R-1, R-2 [a, c], R-4	10 occupants	75 feet
	S	29 occupants	100 feet
Second story	B, F, M, S	29 occupants	75 feet
Third story and above	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP – Not Permitted
NA – Not Applicable
a. Buildings classified as Group R-2 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with *emergency escape and rescue openings* in accordance with Section 1029.
b. Group B, F and S occupancies in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall have a maximum exit access travel distance of 100 feet.
c. This table is used for R-2 occupancies consisting of *sleeping units*. For R-2 occupancies consisting of *dwelling units*, use Table 1021.2(1).

TABLE 3412.6.5 (IEBC [B] TABLE 1401.6.5)
CORRIDOR WALL VALUES

OCCUPANCY	CATEGORIES			
	a	b	c [a]	d [a]
A-1	-10	-4	0	2
A-2	-30	-12	0	2
A-3, F, M, R, S-1	-7	-3	0	2
A-4, B, E, S-2	-5	-2	0	5

a. Corridors not providing at least one-half the exit access travel distance for all occupants on a floor shall be category b.

C104.1 Exit facilities. Exits shall be provided in accordance with Chapters 10 and 11.

Exceptions:

1. The maximum exit access travel distance from any point in the building to an approved exit shall not exceed 300 feet (91 440 mm).

2. One exit is required for each 15,000 square feet (1393.5 m^2) of area or fraction thereof.

Reason: The addition of "exit access" before "travel distance" is for consistency with "exit access travel distance" in Section 1016 and elsewhere in the 2012 IBC, which was established with the approved changes from Proposal E5-09/10-AS. The other changes that are in Sections 1007.6 and 1015.4 are grammatical. Based on our analysis of the 2012 IBC, all instances of "travel distance" in the 2012 IBC where the addition of "exit access" is warranted are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

G57-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.9-G-BRAZIL

G58 – 12

404.9.1 (NEW), 404.9.2 (NEW)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Add new text as follows:

404.9 Travel distance. In other than the lowest level of the *atrium*, where the required *means of egress* is through the *atrium* space, the portion of *exit access* travel distance within the *atrium* space shall be not greater than 200 feet (60 960 mm). The travel distance requirements for areas of buildings open to the *atrium* and where access to the *exits* is not through the *atrium*, shall comply with the requirements of Section 1016.

404.9.1 Exit access across floor of atrium. Where the lowest level of the *atrium* is at the *level of exit discharge,* exit access travel distance shall be in accordance with Section 1016.2.

404.9.2 Interior exit stairways. A maximum of 50 percent of *interior exit stairways* are permitted to egress through the lowest level of an *atrium* where that level is the *level of exit discharge* in accordance with Section 1027.

Reason: The proposed language will clarify an otherwise vague permitted use of an atrium floor to be used as exit access to an exit from the atrium. This design is frequently encountered in healthcare and high-rise residential occupancies.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost impact: The code change proposal will not increase the cost of construction.

G58-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.9.1-G-BAJNAI-BCAC

G59 – 12

202, 406.3, 406.3.1, 406.3.2, 406.3.3, 406.3.4

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Add new definition as follows:

PRIVATE GARAGE. A building or portion of a building in which motor vehicles used by the tenants of the building or buildings on the premises are stored or kept, without provisions for repairing or servicing such vehicles for profit.

Revise as follows:

406.3 Private garages and carports. Private garages and carports shall comply with Sections 406.3.1 through ~~406.3.5~~ 406.3.4.

406.3.1 Classification. ~~Buildings or parts of buildings~~ Private garages and carports shall be classified as Group U occupancies. ~~because of the use or character of the occupancy~~ Each private garage shall be ~~not greater than~~ a 1,000 square feet (93 m^2) in area. ~~or one *story* in height except as provided in Section 406.3.2. Any building or portion thereof that exceeds the limitations specified in this section shall be classified in the occupancy group other than Group U that it most nearly resembles.~~ Multiple private garages are permitted in a building when each private garage is separated from the other private garages by 1-hour fire barriers in accordance with Section 707, or 1-hour horizontal assemblies in accordance with Section 711, or both.

~~**406.3.2 Area increase.** Group U occupancies used for the storage of private or pleasure-type motor vehicles where no repair work is completed or fuel is dispensed are permitted to be 3,000 square feet (279 m^2) where the following provisions are met:~~

1. ~~For a mixed occupancy building, the *exterior wall* and opening protection for the Group U portion of the building shall be as required for the major occupancy of the building. For such a mixed occupancy building, the allowable floor area of the building shall be as permitted for the major occupancy contained therein.~~
2. ~~For a building containing only a Group U occupancy, the *exterior wall* shall not be required to have a *fire-resistance rating* and the area of openings shall not be limited where the *fire separation distance* is 5 feet (1524 mm) or more.~~

~~More than one 3,000-square-foot (279 m_2) Group U occupancy shall be permitted to be in the same structure, provided each 3,000-square-foot (279 m^2) area is separated by *fire walls* complying with Section 706.~~

~~406.3.3~~ 406.3.2 Garages ~~and carports~~ floor surfaces. ~~Carports shall be open on no fewer than two sides. Carport~~ Garage floor surfaces shall be of *approved* noncombustible material. ~~Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.~~ The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

~~**Exception:** Asphalt surfaces shall be permitted at ground level in carports.~~

~~The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.~~

~~406.3.4~~ 406.3.3 Separation. The separation~~s~~ of private garages from other occupancies shall comply with Section 508. Separation of private garages from dwelling units shall comply with ~~the following:~~ Sections 406.3.3.1 through 406.3.3.3.

~~1.~~ **406.3.3.1 Dwelling unit separation.** The private garage shall be separated from the *dwelling unit* and its *attic* area by means of gypsum board, not less than ½ inch (12.7 mm) in thickness, applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a $^5/_8$-inch (15.9 mm) Type X gypsum board or equivalent and ½-inch (12.7 mm) gypsum board applied to structures supporting the separation from habitable rooms above the garage. Door openings between a private garage and the *dwelling unit* shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than $1^3/_8$ inches (34.9 mm) in thickness, or doors in compliance with Section 716.5.3 with a fire protection rating of not less than 20 minutes. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be *self-closing* and self-latching.

~~2.~~ **406.3.3.2 Ducts.** Ducts in a private garage and ducts penetrating the walls or ceilings separating the *dwelling unit,* including its *attic* area, from the garage shall be constructed of sheet steel of not less than 0.019 inches (0.48 mm), in thickness, and shall have no openings into the garage.

406.3.4 Carports. Carports shall be open on at least two sides. Carport floor surfaces shall be of approved noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the requirements for private garages.

Exception: Asphalt surfaces shall be permitted at ground level in carports.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

(~~406.3.4, item 3~~) **406.3.4.1 Carport separation.** A separation is not required between a Group R-3 and U carport, provided the carport is entirely open on two or more sides and there are not enclosed areas above.

Reason: Consistency and coordination among the International Codes is one of the cornerstones of the ICC Code Development process. The ICC Board established the ICC Building Code Action Committee (BCAC) to act as a forum to deal with complex issues ahead of the Code Development Process, identify emerging issues and draft proposed code changes.
This proposed change is a result of the BCAC's work.

Part 1 of this code proposal adds a definition for private garage that is needed in the Code that clarifies the differences between a private garage, an open parking garage and an enclosed parking garage. This new definition for the IBC is modified from two of the legacy codes (1997 UBC Section 208 and 1999 BOCA Section 407.2. The SBC did not define a private garage.) and will serve well for the clarification of the Code that a private garage can be provided in other occupancies beside residential occupancies.

Part 2 of this code proposal is the revision of Section 406.3.1 and the deletion of Section 406.3.2 which were carry-overs from one of the legacy codes (1997 UBC Sections 312.2.1 & 312.2.2) that are really not applicable to the fire protection/life safety requirements in the IBC that address U occupancies in separated or mixed occupancies in a more defined manner than the previous legacy code from which these requirements were taken from. The retaining of a maximum size of 1000 square feet private garage (roughly a 20' x 50' floor area) is a reasonable limitation for a private garage before such a Group U occupancy would be required to be designed as a S-2 parking garage or a S-1 repair garage, as applicable. Such a maximum square footage for a private garage works out well when using IMC Section 402.2 requirement for natural ventilation in a private garage since the typical garage door is a minimum of 8' x 8' (64 sq. ft.), and the minimum natural ventilation required for ventilation is 4% of the floor area being ventilated (i.e. maximum 1000 sq. ft. x 0.04 = minimum 40 sq. ft. opening required < the minimum 64 sq. ft. overhead garage door). Such a garage door will provide an additional (24/40 =) 60% safety factor on the natural ventilation of the space under the Code.

Section 406.3.3 has been modified by breaking it into two sections and matching the language to the IRC language for clarity and correlation. (IRC Section R309 for reference).

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost: This proposal will decrease the cost of construction by clarifying the requirements for private garage separation and increasing coordination of the language with the IRC.

G59-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.3.1-G-BAJNAI-BCAC

G60 – 12
202, 406.3.1, 406.3.2, 406.3.3, 406.3.4, 508.3.3

Proponent: George Kellogg, City of Rocklin, representing Sacramento Valley Association of Building Officials

Revise as follows:

406.3 Private garages and carports. Private garages and carports shall comply with Sections 406.3.1 through 406.3.5.

406.3.1 Classification. ~~Buildings or parts of buildings classified as Group U occupancies because of the use or character of the occupancy~~ *Private garages* and *private carports* shall be not greater than 1,000 square feet (93 m^2) in area or one *story* in height except as provided in Section 406.3.2. Any building or portion thereof that exceeds the limitations specified in this section shall be classified in the occupancy group other than Group U that it most nearly resembles.

406.3.2 Area increase. ~~Group U occupancies used for the storage of private or pleasure-type motor vehicles where no repair work is completed or fuel is dispensed~~ *Private garages* and *private carports* are permitted to be 3,000 square feet (279 m^2) where the following provisions are met:

1. For a mixed occupancy building, the *exterior wall* and opening protection for the Group U portion of the building shall be as required for the major occupancy of the building. For such a mixed occupancy building, the allowable floor area of the building shall be as permitted for the major occupancy contained therein.
2. For a building containing only a Group U occupancy, the *exterior wall* shall not be required to have a *fire-resistance rating* and the area of openings shall not be limited where the *fire separation distance* is 5 feet (1524 mm) or more.

More than one 3,000-square-foot (279 m^2) Group U occupancy shall be permitted to be in the same structure, provided each 3,000-square-foot (279 m^2) area is separated by *fire walls* complying with Section 706.

406.3.3 ~~Garages and carports~~ Floor Surface. ~~Carports shall be open on no fewer than two sides.~~ Private carport floor surfaces shall be of *approved* noncombustible material. ~~Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.~~

Exception: Asphalt surfaces shall be permitted at ground level in private carports.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

406.3.4 Separation. Separations shall comply with ~~the following:~~ Section 508.4

Exceptions:

1. The *private garage* shall be separated from the Group R-3 *dwelling unit* and its *attic* area by means of gypsum board, not less than ½ inch (12.7 mm) in thickness, applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a 5/8-inch (15.9 mm) Type X gypsum board or equivalent and ½-inch (12.7 mm) gypsum board applied to structures supporting the separation from habitable rooms above the garage. Door openings between a private garage and the Group R-3 *dwelling unit* shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than 13/8 inches (34.9 mm) in thickness, or doors in compliance with Section 716.5.3 with a

fire protection rating of not less than 20 minutes. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be *self-closing* and self-latching.

2. Ducts in a private garage and ducts penetrating the walls or ceilings separating the *dwelling unit,* including its *attic* area, from the private garage shall be constructed of sheet steel of not less than 0.019 inches (0.48 mm), in thickness, and shall have no openings into the private garage.
3. A separation is not required between a Group R-3 and U private carport, provided ~~the carport is entirely open on two or more sides and~~ there are not enclosed areas above.

Revise as follows:

508.3.3 Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from other occupancies contiguous to them in accordance with the requirements of Section 420.
3. Group U Private Garages and Carports shall be separated from all other occupancies in accordance with Section 508.4 except Group R-3.

Revise as follows:

SECTION 202
DEFINITIONS

CARPORT, PRIVATE. A private garage that is open on at least two sides

GARAGE, PARKING. A structure or portion of a structure that is used for the parking or storage of private motor vehicles.

GARAGE, PRIVATE. A structure or portion of a structure used for the storage of private or pleasure-type motor vehicles where no repair work is completed or fuel is dispensed.

GARAGE, PUBLIC PARKING. A structure or portion of structure that is used for the storage of private or pleasure-type motor vehicles other than a Private Garage or a Private Carport.

OPEN PARKING GARAGE. ~~A structure or portion of a structure~~ A parking garage with the openings as described in Section 406.5.2 on two or more sides. ~~that is used for the parking or storage of private motor vehicles as described in Section 406.5.3.~~

Reason: The proposed code revisions clarify the Code intent to allow Private Garages and Carports to be an accessory occupancy to any occupancy classification provided the requirements of Section 406.1 are met. Changes to the separation requirements for occupancies other than "R Occupancies" makes the Private Garage portions of other occupancies consistent with other code provisions. Proposed changes also elimination redundancies and simplify wording.

Cost Impact: The code change proposal will not increase the cost of construction.

G60-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CARPORT, PRIVATE (NEW)-G-KELLOGG

G61 – 12
406.3.4 (NEW), 1003.2; (IFC [B] 1003.2)

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Add new text as follows:

406.3.4 Clear height. In private garages and carports the clear height in vehicle and pedestrian traffic areas shall be not less than 7 feet (2134 mm). Vehicle and pedestrian areas accommodating van-accessible parking shall comply with Section 1106.5.

Revise as follows:

1003.2 (IFC [B] 1003.2) Ceiling height. The *means of egress* shall have a ceiling height of not less than 7 feet 6 inches (2286 mm).

Exceptions:

1. Sloped ceilings in accordance with Section 1208.2.
2. Ceilings of *dwelling units* and *sleeping units* within residential occupancies in accordance with Section 1208.2.
3. Allowable projections in accordance with Section 1003.3.
4. *Stair* headroom in accordance with Section 1009.5.
5. Door height in accordance with Section 1008.1.1.
6. *Ramp* headroom in accordance with Section 1010.6.2.
7. The clear height of floor levels in vehicular and pedestrian traffic areas ~~in~~ of public and private parking garages in accordance with Section 406.4.1.
8. Areas above and below *mezzanine* floors in accordance with Section 505.2.

Reason: The code is silent regarding the ceiling height on private garages. The proposed text is identical to Section 406.4.1 which applies to public garages. Therefore this change would make the ceiling height of these two provisions identical. Without adding this provision, ceiling height will be governed by Section 1003.2 which requires a ceiling height of 7 feet 6 inches.

Section 406.4.1 of the 2012 IBC reads:

> ***406.4.1 Clear height.*** *The clear height of each floor level in vehicle and pedestrian traffic areas shall be not less than 7 feet (2134 mm). Vehicle and pedestrian areas accommodating van-accessible parking shall comply with Section 1106.5.*

Cost Impact: The proposed changes will not increase the cost of construction.

G61-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.3.4 (NEW)-G-RICE

G62 – 12
406.3.4

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

406.3.4 Separation. ~~Separations shall comply with the following:~~ Private garages shall be separated from other occupancies in the same building in accordance with Section 508.

Exceptions:

1. ~~The~~ Where located adjacent to a dwelling unit, a private garage shall be separated from the *dwelling unit* and its *attic* area by means of gypsum board, not less than ½ inch (12.7 mm) in thickness, applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a $^5/_8$-inch (15.9 mm) Type X gypsum board or equivalent and ½-inch (12.7 mm) gypsum board applied to structures supporting the separation from habitable rooms above the garage.
   1.1. Door openings between a private garage and the *dwelling unit* shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than 1$^3/_8$ inches (34.9 mm) in thickness, or doors in compliance with Section 716.5.3 with a fire protection rating of not less than 20 minutes. Doors shall be *self-closing* and self-latching.
   1.2. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. ~~Doors shall be *self-closing* and self-latching.~~
   ~~2.~~ 1.3. Ducts in a private garage and ducts penetrating the walls or ceilings separating the *dwelling unit,* including its *attic* area*,* from the garage shall be constructed of sheet steel of not less than 0.019 inches (0.48 mm), in thickness, and shall have no openings into the garage.

~~3.~~2. A separation is not required between a Group R-3 and U carport, provided the carport is entirely open on two or more sides and there are not enclosed areas above.

Reason: The code in Section 406 appears to be silent with respect to the separation requirements between a private garage and something other than a dwelling unit. Private garages are not limited be being accessory to residences, but could be accessory to other uses such as a small office building. The existing provisions of Section 406.3.4 only address the separations between a dwelling unit and a private garage or carport. This change directs the code user to the mixed occupancy section of the code to address the separations either as an accessory occupancy, non-separated or separated mixed occupancy. It then takes the existing text and changes it into an exception to sending people to Section 508.

The other change is to reformat what is currently Items 1 and 2 of Section 406.3.4. The current Item 1 has various sub-requirements applying to the wall separating the private garage from a dwelling unit. The provision for self-closing and self-latching doors is simply being moved to be adjacent to the remaining door requirements. The current item 2 would appear not to be a stand alone provision nor a distinct exception for the separation of private garage and dwelling unit, but is another element of the separation described in Item 1.

Cost Impact: The proposed changes will not increase the cost of construction.

G62-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.3.4-G-RICE

G63 – 12
406.4.3

Proponent: Donald R. Monahan, Walker Parking Consultants, representing Parking Consultants Council of the National Parking Association (don.monahan@walkerparking.com)

Revise as follows:

406.4.3 Vehicle barriers. *Vehicle barriers* not less than 2 feet 9 inches (835 mm) in height shall be placed ~~at the ends of drive lanes, and at the end of parking spaces~~ where the vertical distance to the ground or surface directly below is greater than 1 foot (305 mm). *Vehicle barriers* shall comply with the loading requirements of Section 1607.8.3.

Exception: *Vehicle barriers* are not required in vehicle storage compartments

Reason: The current language implies that only those walls at the end of parking spaces or at the end of a drive aisle need to comply with the vehicle barrier requirements. Sidewalls at parking spaces are also vulnerable to vehicle impact as the vehicle maneuvers into the stall. Similarly, the side walls of vehicle-only ramps are vulnerable to collision if a vehicle is out of control due to driver heart attack, slippery or wet surfaces, or obstacles on the ramp. All walls at vertical surface displacements need to meet these vehicle barrier requirements.

Cost Impact: We believe most responsible designers already provide vehicle barriers or ramped floors at all vertical transitions in floor surfaces, such that this relatively minor clarification will not have a significant cost impact.

G63-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.4.3-G-MONAHAN

G64 – 12
406.6.2, 406.8.2

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

406.6.2 Ventilation. ~~A mechanical *ventilation* system shall be provided~~ Enclosed parking garages shall be ventilated in accordance with the *International Mechanical Code*.

406.8.2 Ventilation. Repair garages shall be ~~mechanically~~ ventilated in accordance with the *International Mechanical Code*. ~~The *ventilation* system shall be controlled at the entrance to the garage~~.

Reason: The mechanical code does not prohibit natural ventilation in all cases in parking garages and repair garages. It's not up to the IBC to determine that a mechanical ventilation system is warranted in all cases. Likewise, it's up to the designer to determine where the controls are to be located for a mechanical as there is no technical justification to locate the controls at the garage entrance. There may be many entrances.

Cost Impact: The proposed changes will not increase the cost of construction.

G64-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.6.2-G-MCMANN

G65 – 12
407.2.5 (NEW)

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Add new text as follows:

407.2.5 Cooking facilities. In Group I-2 nursing homes, rooms or spaces that contain domestic cooking facilities shall be permitted to be open to the corridor where the number of sleeping units within the smoke compartment is limited to 30 residents and all of the following requirements are met:

1. Only one area with domestic cooking facilities is permitted within a smoke compartment.
2. The types of cooking appliances are are limited to ovens, cooktops, ranges, warmers and microwaves.
3. The corridor is a clearly identified space delineated by construction or floor pattern, material or color.
4. The space containing domestic cooking facilities shall be arranged so as not to obstruct access to the required exit.
5. A domestic cooking hood installed and constructed in accordance with Section 505 of the International Mechanical Code is provided over cooktops and ranges.
6. The domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of domestic cooking equipment. Pre-engineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.
7. A manual actuation device for the hood suppression system shall be installed in accordance with Section 904.11.1 and 904.11.2 of the International Fire Code.
8. A shutdown for the fuel and electrical power supply to the cooking equipment shall be provided and shall be accessible only to staff.
9. A portable fire extinguisher shall be installed within 30 feet (9144 mm) of domestic cooking appliances complying with Section 906.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

As nursing homes move away from institutional models, it is critical to have a functioning kitchen that can serve as the hearth of the home. Instead of a large centralized, institutional kitchen where all meals are prepared and delivered to a central dining room or the resident's room, the new "household model" nursing home uses de-centralized kitchens and small dining areas to create the feeling and focus of home. For persons with dementia, it is particularly important to have spaces that look familiar, like the kitchen in their former home ,to increase their understanding and ability to function at their highest level.

Allowing kitchens, that serve a small, defined group of residents, to be open to common spaces, and in some instances corridors, are critically important to enhancing the feeling and memories of home for older adults. This allows residents to see and smell the food being prepared, which can enhance their appetites and evoke positive memories. Some residents, based on their abilities and cognition level may even be able to participate in food preparation activities such as stirring, measuring ingredients, peeling vegetables, or folding towels. This becomes a social activity, where they can easily converse with the staff member cooking, as well as a way for the resident to maintain their functional abilities and to feel that they are still an important contributing member of society.

We know that unattended cooking equipment is the leading cause of fires. However, allowing the kitchen to be open also allows the nursing home staff to more carefully supervise the space so that if an incident were to occur, it would be spotted and dealt with faster than if the kitchen was completely behind closed doors. Health care facilities have the benefit of having awake-staff 24 hours a day. These staff members know the building layout and the residents well, and are trained to handle emergencies. The locked fuel shut-off switch will prevent cooking activities occurring without staff knowledge.

Moreover, studies have shown that a single low-flow residential sprinkler head is effective "to control both [a] cooking oil fire and [an] appliance fire, despite shielding by the cabinets, while extinguishing the fire spread to the cabinets and walls." [ref: NIST special publication 1066: Residential kitchen fire suppression research needs, Madrzykowski, Hamins & Mehta, Feb. 2007] As all nursing homes are already required to have quick-response sprinklers throughout, we believe that more than adequate safety is being provided when preparing food up to 16 residents, and by adding the automatic chemical suppression in the hood, we are also providing more than adequate safety for up to 30 residents. The volume of meals prepared in both of these cases are much more similar to a single-family home rather than a commercial restaurant setting.

The fire safety record for nursing homes is one of the lowest of any occupancy in the United States based on NFPA fire data. The number of fire deaths from multiple death fires has averaged 1.7 deaths/year for the last 20 years. The number of single fire deaths in nursing averages 3-5 deaths/ year. The population of nursing homes is 1.7 million. Compared to the number of residents 65 or over living in residential occupancies (32 million) and the number of fire deaths/year of this population, **a resident over 65 in a nursing home is 12 times less likely to die in a fire than a resident over 65 living in a private residential occupancy.**

All new nursing homes have been required to be sprinklered since 2003, and currently 95% of all existing nursing homes are sprinklered. All existing nursing homes are required by federal regulations to be fully sprinklered by August 13, 2013. **There has never been a multiple death fire in a fully sprinklered nursing home** based on 15 years of NFPA fire data. A review of nursing home fire data from 1970 (41 years) not a single multiple death nursing home fire resulted from a fire originating in a kitchen. The majority of single death fires are the result of a resident smoking while on oxygen or the ignition of their clothing or bedding from smoking material. We could find no fire data of any resident of a nursing home, single or multiple death fire, dying from a fire that originated in a kitchen.

In nursing home occupancies, the strategy is to defend in place, taking advantage of the smoke compartments to move residents away from smoke and fire. The smaller size of the household units that would contain these open kitchens, rather than the larger institutional style nursing homes many of us know, means that evacuations to an adjacent compartment or to the exterior is faster and the smaller size of any one of these units limits the number of people at risk.

An additional safety feature, in this proposal, is the inclusion of a deactivation switch that is locked and only accessible to staff. This will prevent unauthorized use of the cooking appliance without staff supervision. Staff members would need to be trained not only in basic food handling precautions but also in basic fire safety and extinguisher use. A fire extinguisher would be required in each kitchen area in addition to the suppression required in the hood and the sprinklers in the facility. These are all additional levels of safety that are being added to this application and will help to protect the residents.

The choice of thirty or fewer residents as the limiting number of residents that could be housed within a single unit with an open kitchen was based on a requirement from the Veterans Administration to serve the needs in their facilities, as well as current trends in the design of these types of facilities. These small nursing homes or nursing home “household” units generally range in size from 10 to 30 residents. The committee that drafted this proposal included providers, industry representatives, code and design professionals who are familiar with this design model and its operation. This group’s conclusion was that 30 residents allowed this open kitchen application for the overwhelming majority of facilities in the industry because staffing for thirty is widely considered an economical staffing ratio for the majority of organizations. Yet the designs for this number are still relatively small in size. These designs range from around 6,000 square feet for the smallest 10 person units to around 17,000 square feet even for units housing as many as 30. In general, at these unit sizes, the distances to exits, either to the exterior or to other compartments is much shorter than commonly seen in traditional nursing homes. This committee felt that in combining the added safety features proposed along with the improved evacuation distances and reduced number of people at risk, the limitation of 30 people maintained good safety, yet met the needs of a majority of the industry.

If this proposal is approved, there will be a reference in Table 906.1 for fire extinguishers.

Example of Kitchen open to Corridor.

Example of shutdown

Cost Impact: This code change proposal will not increase the cost of construction. Reduction

G65-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.2.5#1-G-BALDASSARRA-CTC

G66 – 12
407.2.5 (NEW)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Add new text as follows:

407.2.5 Nursing home housing units. In Group I-2 nursing homes, within areas where nursing home residents are housed, shared living spaces, group meeting or multipurpose therapeutic spaces shall be permitted to be open to the *corridor*, where all of the following criteria are met:

1. The walls and ceilings of the space are constructed as required for *corridors*.
2. The spaces are not occupied as resident sleeping rooms, treatment rooms, incidental uses in accordance with Section 509, or hazardous uses.
3. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
4. The *corridors* onto which the spaces open, in the same *smoke compartment*, are protected by an automatic fire detection system installed in accordance with Section 907, or the *smoke compartment* in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
5. The space is arranged so as not to obstruct access to the required *exits*.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

In nursing home occupancies, residents are encouraged to spend time outside of their rooms. Wayfinding and orientation problems are common in nursing homes residents, and research has shown that direct visibility to a desired location is more effective for cuing than signage. Therefore, having a variety of shared living spaces open to the corridor encourages socialization, encourages interaction, and is important to resident well-being. Further, being able to preview activities that are occurring helps to encourage joining and allows reluctant participants to join at their own pace. Finally, a more open plan allows staff to more easily see residents throughout the course of the day.

Adhoc Health has a proposal to limit storage to containers with 10 cubic feet or greater in Table 509. This would address the issue of storage within areas open to the corridor.

Example of Living room

Example of Dining Room

Cost Impact: The proposed changes will not increase the cost of construction. There will be a reduction in cost.

G66-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407#2-G-BALDASSARRA-CTC

G67 – 12
407.3

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

407.3 Corridor wall construction. *Corridor* walls shall be constructed as smoke partitions in accordance with Section 710.

Exception. Corridor walls in suites.

Reason: Over the past several cycles, the IBC has evolved to regulate the design of Group I-2 occupancies (hospitals and nursing care on a 24 hour basis) in a manner consistent with the regulations required by the Centers for Medicare & Medicaid Services (CMS) and The Joint Commission for accreditation (NFPA 101-2000; Life Safety Code). One of the biggest healthcare design features added in recent years is the concept of "care suites." By definition in IBC Section 202, a "care suite" is "A group of treatment rooms, care recipient sleeping rooms and their associated support rooms or spaces and circulation space within Group I-2 occupancies where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.3." Typical care suites are those where the patients need close supervision and monitoring, and include ICU areas. Because of the heighten awareness in the care suite with 24-hour supervision, some of the typical fire protection features are allowed to be omitted. While there is a lot of interpretation in regard to how corridors walls in a care suites are to be constructed, this code change seeks to make it clear that when there are corridors in a care suite they are not required to be smoke partitions, and that the doors in those walls are not required to meet limit the transfer of smoke or be positive latching.

Cost Impact: The proposed changes will not increase the cost of construction.

G67-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.3-G-RICE

G68 – 12

202, 407.4, 422.3.1 (NEW)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare and Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

407.4 Means of egress. Group I-2 occupancies shall be provided with means of egress complying with Chapter 10 and Sections 407.4.1 through 407.4.3. The fire safety and evacuation plans provided in accordance with Section 1001.4 shall identify the building components necessary to support a *defend in place* emergency response in accordance with IFC Sections 404 and 408.

422.3.1 Means of egress. Where ambulatory care facilities require smoke compartmentation in accordance with Section 422.3 the fire safety evacuation plans provided in accordance with Section 1001.4 shall identify the building components necessary to support a *defend in place* emergency response in accordance with IFC Sections 404 and 408.

Add new definition to Chapter 2 as follows:

DEFEND IN PLACE. A method of emergency response that engages building components and trained staff to provide occupant safety during an emergency. Emergency response involves remaining in place, relocating within the building, or both, without evacuating the building.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

This code change defines a commonly used concept with a broadly accepted term for use with Group I-2 and identifies several instances where the defend in place concept should be permitted and recognized.

Defend in place, or protect in place, is a concept that has long been employed as the preferred method of fire response in hospitals due to the fragile nature of the occupants. Occupants in this setting are often dependent upon the building infrastructure and immediate evacuation would place their lives at risk. This infrastructure typically includes life support systems such as medical gases, emergency power, and environmental controls that rely on continued building operation. Previous versions of this code and legacy codes have created a tried and tested set of requirements to support this concept, such as smoke compartmentation and areas of refuge. However, previous codes have not specifically described the concept of occupants remaining within a building during a fire emergency which leads to confusion and misapplication during design and enforcement.

This change identifies Group I-2 as a location where this type of emergency response is permitted. The codes governing hospitals, nursing homes, and other Group I-2 classes are designed to support the defend in place use. While the code has been silent on the underlying concept, the defend in place strategy has been the commonly accepted practice in these facilities. When the new Ambulatory Care Facilities section was being drafted, the goal was to create a type of defend in place. Defend in place is only appropriate when smoke compartments are created, therefore the allowance to use this strategy is predicated on the smoke compartmentation section.

A proposal is being submitted to the IFC to clarify further the defend in place concept in Section 404 and 408. [Should we place draft IFC proposal here]

Cost Impact: This proposal will not increase the cost of construction; the healthcare industry already has this documentation and information on file for compliance with state licensing and federal certification standards.

G68-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4-G-Williams-Adhoc

G69 – 12
407.4.1

Proponent: Paul Armstrong, City of El Monte, representing Orange Empire Code Committee (paul@jaspacific.com)

Revise as follows:

407.4.1 Direct access to a corridor. Habitable rooms in Group I-2 occupancies shall have an *exit access* door leading directly to a *corridor*.

Exceptions:

1. Rooms or care suites with *exit* doors opening directly to the outside at ground level.
2. Rooms arranged as *care suites* complying with Section 407.4.3

Reason: There are many single story hospitals where an exit door serves the suite and a corridor is not necessary.

Cost Impact: There is no increase in cost of construction due to this revision.

G69-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.1-G-ARMSTRONG

G70 – 12
202, 407.4.2, 407.4.3.3, 407.4.3.4, 407.4.3.5, 407.4.3.5.1, 407.4.3.5.3

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

CARE SUITE. In Group I-2 occupancies, a group of treatment rooms, care recipient sleeping rooms and ~~their associated~~ the support rooms or spaces and circulation space within the suite ~~Group I-2 occupancies~~ where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.3.

Revise as follows:

407.4.2 Travel distance. The travel distance between any point in a Group I-2 occupancy sleeping room, not located in a *care suite,* and an *exit access* door in that room shall be not greater than 50 feet (15 240 mm).

407.4.3 Group I-2 care suites. *Care suites* in Group I-2 shall comply with Section 407.4.3.1 through 407.4.3.4 and either Section 407.4.3.5 or 407.4.3.6.

407.4.3.1 Exit access through care suites. *Exit access* from all other portions of a building not classified as a *care suite* shall not pass through a *care suite*. In a *care suite* required to have more than one *exit*, one *exit access* is permitted to pass through an adjacent *care suite* provided all of the other requirements of Sections 407.4 and 1014.2 are satisfied.

407.4.3.2 Separation. *Care suites* shall be separated from other portions of the building by a smoke partition complying with Section 710.

~~**407.4.3.3 One intervening room.** For rooms other than sleeping rooms located within a *care suite*, *exit access* travel from the *care suite* shall be permitted through one intervening room where the travel distance to the *exit access* door from the *care suite* is not greater than 100 feet (30 480 mm).~~

407.4.3.3 Access to Corridor. Movement from habitable rooms shall not require passage through no more than 3 doors and 100 feet (30 480 mm) travel distance within the suite.

> **Exception:** The travel distance shall be permitted to be increased to 125 feet (38 100 mm) where an automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.

~~**407.4.3.4 Two intervening rooms.** For rooms other than sleeping rooms located within a *care suite*, *exit access* travel within the *care suite* shall be permitted through two intervening rooms where the travel distance to the *exit access* door from the *care suite* is not greater than 50 feet (15 240 mm).~~

~~**407.4.3.5**~~ **407.4.3.4 Care suites containing sleeping room areas.** Sleeping rooms shall be permitted to be grouped into *care suites* ~~with one intervening room~~ if one of the following conditions is met:

1. The ~~intervening room within~~ the *care suite* is not used as an *exit access* for more than eight care recipient beds.
2. The arrangement of the *care suite* allows for direct and constant visual supervision into the sleeping rooms by care providers.

3. <u>An automatic smoke detection system is provided in the sleeping rooms and installed in accordance with NFPA 72.</u>

~~407.4.3.5.1~~ <u>407.4.3.4.1</u> Area. *Care suites* containing sleeping rooms shall be not greater than ~~5,000~~ <u>7,500</u> square feet (~~465~~ <u>696</u> m^2) in area.

> <u>**Exception:** *Care suites* containing sleeping rooms shall be permitted to be not greater than 10,000 sq feet (929 m^2) in area where automatic smoke detection system is provided throughout the *care suite* and installed in accordance with NFPA 72.</u>

~~407.4.3.5.2~~ <u>407.4.3.4.2</u> Exit access. Any sleeping room, or any *care suite* that contains sleeping rooms, of more than 1,000 square feet (93 m2) shall have no fewer than two *exit access* doors from the *care suite* located in accordance with Section 1015.2.

~~**407.4.3.5.3 Travel distance.** The travel distance between any point in a *care suite* containing sleeping rooms and an *exit access* door from that *care suite* shall be not greater than 100 feet (30 480 mm).~~

Reason: Reason: This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

In relation to the code change proposal dealing with size and configuration of care suites, the definition is being proposed with changes to address the scope of which the suites are used. Suites are recognized to be an effective tool to provide some flexibility in reaching an exit access, due to functional considerations. Use of suites is a particularly useful tool at Intensive Care Units and Emergency Departments in patient treatment areas. The ability to have full visual wall systems that have a breakaway function is extremely beneficial during any type of emergency situation, including defend-in-place, evacuation as well as day-to-day care. These systems allow for observation while providing a level of privacy for the patient. These systems are also flexible enough to handle multiple levels of acuity in the same space.

It is not the intent to broaden the definition so widely as to effectively eliminate the use of corridors as exit access. This change attempts to clarify that associated support spaces of care suites, such as pharmacies, laboratories, linen rooms and storage rooms which are not located within the care suite are not required to be classified as care suites.

The proposal relaxes several requirements due to providing additional fire protection features and clarifies code intent on requirements. The 5,000 square ft limitation for care suites was in legacy building codes before sprinkler protection was required in Group I-2 occupancies. Sprinkler protection provides additional life safety to building occupants which justifies the care suite containing sleeping rooms area increase to 7,500 square ft. Providing an automatic smoke detection system throughout a care suite containing sleeping rooms or constant staff supervision into the sleeping rooms further justifies increasing the area to 10,000 square ft.

The proposal also removes the intervening room from the travel distance requirements as an intervening room is difficult to define and conflicts with industry practice for design of certain units. For example does a pair of “cross corridor” doors within a suite constitute an intervening room? A provision was added to limit the number of doors required for a patient sleeping bed to reach the exit access corridor which addresses concerns regarding patient evacuation of the suite. Current requirements make it difficult to plan the sleeping portion of the suite in under 5,000 square feet, primarily because of the required size of the patient sleeping room. In the past, a sixteen bed area could get under the space requirement, with support spaces such as clean and soiled utilities falling outside that portion of the suite. However, the Intensive Care Unit programming data supports the need for the basic patient room / staff space elements of the program can be accommodated in under 7,500 square feet, but not less than 5,000 square feet. In order to properly staff a unit, the need for unobstructed view from a nurses station to a patient room is needed. This cannot be done with the barrier to form a suite down the middle of the unit, and therefore the staff area. The proposed change enables removal of that barrier while optimizing operational efficiency of the unit, including the fire safety watch of the unit by staff.

To achieve a 7,500 square foot suite, the program becomes very limited to the spaces that are involved in the direct care of the patient, as demonstrated on the Intensive care Suite program developed for this proposal (see the “IntensiveCareUnit-7500” tab in the noted programming file). Key spaces such as the break room and utility spaces are outside of the suite, which is workable from an operational standpoint, but not ideal. Key spaces such as staff support and utility spaces are outside of the suite. Increasing to 10,000 square feet allows inclusion of staff more staff and support spaces within the suite. Operationally, this is a key factor because the staff will not need to leave the suite on their break time, when retrieving supplies, or to access the staff toilet because it improves the response time of the staff during a medical emergency, or a fire / safety situation.

The proposal clarifies the 50 ft travel distance limitation from a patient sleeping room to an exit access door does not apply in care suites. The provision of crossing through three doors is also being introduced to help clarify what is now called out as ‘intervening spaces.’ Use of three doors is much clearer to a reviewer and designer, rather than defining what is an intervening space on a project-by-project basis.

The proposal also permits smoke detection to be provided in sleeping rooms of care suites where direct supervision of patients by staff is not possible. Smoke detection in the patient room provides equivalent early detection of a fire. The proposal attempts to maintain the level of life safety in care suites while providing more options to health care design professionals to facilitate excellent patient experience and treatment.

The travel distance provisions in care suites with sleeping rooms was increased to 125 ft to reach an exit access corridor based on the additional level of protection provided by direct and constant supervision into sleeping rooms by care providers or complete smoke detection throughout the suite as well as limiting the number of doors permitted for a patient sleeping bed to reach the exit access corridor.

This committee also has a correlative change to IFC with proposed language in IBC 407.8 and 907.2.6.2 coordinates with the proposed language automatic smoke detection system requirements in IBC 407.4.3.

Refer to attached "ICC_AHCHC Programming_10-10-2011.xlsx" for programming data as it relates to Intensive Care Units. This program is based on the noted version of the AIA or FGI Guidelines for Planning of Healthcare Facilities, for the support of the 7,500 square foot increases as noted above. A copy of the programming document can be found at www.iccsafe.org.

Cost Impact: The proposed changes will not increase the cost of construction.

G70-12/13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.2-G-Williams-Adhoc

G71 – 12

PART I – IBC MEANS OF EGRESS
407.4.2, 407.4.3.3, 407.4.3.4, 407.4.3.5, 407.5, 408.6.1, 408.8.1, 422.3,
PART II – IFC
906.2, Table 906.3(1), Table 906.3(2), 907.2.6, 907.2.10.1 (IBC [F] 906.2, Table 906.3(1), Table 906.3(2), 907.2.6, 907.2.10.1)
PART III – IPC
403.3, 403.3.4, 403.5 (IBC [P] 2902.3.2, 2902.3.3, 2902.5)

Proponent: Philip Brazil. PE, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development (pbrazil@reidmiddleton.com)

THIS IS A 3 PART PROPOSAL AND ALL THREE PARTS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

PART I – IBC MEANS OF EGRESS

Revise as follows:

407.4.2 ~~Travel distance~~ Distance of travel. The ~~travel~~ distance of travel between any point in a Group I-2 occupancy sleeping room and an *exit access* door in that room shall be not greater than 50 feet (15 240 mm).

407.4.3.3 One intervening room. For rooms other than sleeping rooms located within a *care suite*, *exit access* travel from the *care suite* shall be permitted through one intervening room where the ~~travel~~ distance of travel to the *exit access* door from the *care suite* is not greater than 100 feet (30 480 mm).

407.4.3.4 Two intervening rooms. For rooms other than sleeping rooms located within a *care suite*, *exit access* travel within the *care suite* shall be permitted through two intervening rooms where the ~~travel~~ distance of travel to the *exit access* door from the *care suite* is not greater than 50 feet (15 240 mm).

407.4.3.5.3 ~~Travel distance~~ Distance of travel. The ~~travel~~ distance of travel between any point in a *care suite* containing sleeping rooms and an *exit access* door from that *care suite* shall be not greater than 100 feet (30 480 mm).

407.5 Smoke barriers. *Smoke barriers* shall be provided to subdivide every *story* used by persons receiving care, treatment or sleeping and to divide other *stories* with an *occupant load* of 50 or more persons, into no fewer than two *smoke compartments*. Such *stories* shall be divided into *smoke compartments* with an area of not more than 22,500 square feet (2092 m^2) and the ~~travel~~ distance of travel from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60 960 mm). The *smoke barrier* shall be in accordance with Section 709.

408.6.1 Smoke compartments. The number of residents in any *smoke compartment* shall be not more than 200. The ~~travel~~ distance of travel to a door in a *smoke barrier* from any room door required as *exit access* shall be not greater than 150 feet (45 720 mm). The ~~travel~~ distance of travel to a door in a *smoke barrier* from any point in a room shall be not greater than 200 feet (60 960 mm).

408.8.1 Occupancy Conditions 3 and 4. Each sleeping area in Occupancy Conditions 3 and 4 shall be separated from the adjacent common spaces by a smoke-tight partition where the ~~travel~~ distance of travel from the sleeping area through the common space to the *corridor* exceeds 50 feet (15 240 mm).

422.3 Smoke compartments. Where the aggregate area of one or more *ambulatory care facilities* is greater than 10,000 square feet (929 m^2) on one *story*, the *story* shall be provided with a *smoke barrier* to subdivide the *story* into no fewer than two *smoke compartments*. The area of any one such *smoke compartment* shall be not greater than 22,500 square feet (2092 m^2). The ~~travel~~ distance of travel from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60 960 mm). The *smoke barrier* shall be installed in accordance with Section 709 with the exception that *smoke barriers* shall be continuous from outside wall to an outside wall, a floor to a floor, or from a *smoke barrier* to a *smoke barrier* or a combination thereof.

PART II – IFC

Revise as follows:

IFC 906.2 (IBC [F] 906.2) General requirements. Portable fire extinguishers shall be selected and installed in accordance with this section and NFPA 10.

Exceptions:

1. The ~~travel~~ distance of travel to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

TABLE 906.3(1) [IBC [F] TABLE 906.3(1)]
FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS

	LIGHT (low) HAZARD OCCUPANCY	ORDINARY (moderate) HAZARD OCCUPANCY	EXTRA (high) HAZARD OCCUPANCY
Minimum Rated Single Extinguisher	2-A [c]	2-A	4-A [a]
Maximum Floor Area per Unit of A	3,000 square feet	1,500 square feet	1,000 square feet
Maximum Floor Area for Extinguisher [b]	11,250 square feet	11,250 square feet	11,250 square feet
Maximum ~~Travel~~ Distance of Travel to Extinguisher	75 feet	75 feet	75 feet

(Portions to table not shown remain unchanged)

TABLE 906.3(2) [IBC [F] TABLE 906.3(2)]
FIRE EXTINGUISHERS FOR FLAMMABLE OR COMBUSTIBLE LIQUIDS
WITH DEPTHS LESS THAN OR EQUAL TO 0.25 INCH

TYPE OF HAZARD	BASIC MINIMUM EXTINGUISHER RATING	MAXIMUM ~~TRAVEL~~ DISTANCE OF TRAVEL TO EXTINGUISHERS (feet)
Light (Low)	5-B 10-B	30 50
Ordinary (Moderate)	10-B 20-B	30 50
Extra (High)	40-B 80-B	30 50

(Portions to table not shown remain unchanged)

907.2.6 (IBC [F] 907.2.6) Group I. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2 and 907.2.6.3.3.

Exceptions:

1. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall not be required at *exits* if located at all care providers' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that ~~travel~~ the distances of travel required in Section 907.4.2.1 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is *approved* by the fire code official.

907.2.10.1 (IBC [F] 907.2.10.1) Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-4 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two *stories* in height where all individual *sleeping units* and contiguous *attic* and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour *fire partitions* and each individual *sleeping unit* has an *exit* directly to a *public way*, *egress court* or *yard*.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
   2.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2;
   2.2. The notification appliances will activate upon sprinkler waterflow; and 2.3. At least one manual fire alarm box is installed at an *approved* location.
3. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at *exits* where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that ~~travel~~ the distances of travel required in Section 907.4.2.1 are not exceeded.

PART III – IPC

Revise as follows:

403.3 (IBC [P] 2902.3.2) Location of toilet facilities in occupancies other than malls. In occupancies other than covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

Exception: The location and maximum ~~travel~~ distances of travel to required employee facilities in factory and industrial occupancies are permitted to exceed that required by this section, provided that the location and maximum ~~travel~~ distance of travel are *approved*.

403.3.4 (IBC [P] 2902.3.3) Location of toilet facilities in malls. In covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 300 feet (91 440 mm). In mall buildings, the required facilities shall be based on total square footage within a covered mall building or within the perimeter line of an open mall building, and facilities shall be installed in each individual store or in a central toilet area located in accordance with this section. The maximum ~~travel~~ distance of travel to central toilet facilities in mall buildings shall be measured from the main entrance of any store or tenant space. In mall buildings, where employees' toilet facilities are not provided in the individual store, the maximum ~~travel~~ distance of travel shall be measured from the employees' work area of the store or tenant space.

403.5 (IBC [P] 2902.5) Drinking fountain location. Drinking fountains shall not be required to be located in individual tenant spaces provided that public drinking fountains are located within a ~~travel~~ distance of travel of 500 feet of the most remote location in the tenant space and not more than one story above or below the tenant space. Where the tenant space is in a covered or open mall, such distance shall not exceed 300 feet. Drinking fountains shall be located on an accessible route.

Reason: The change from "travel distance" to "distance of travel" more clearly distinguishes between "exit access travel distance" as specified in Section 1016 and a travel distance that is other than an exit access travel distance for which the provisions of Section 1016 do not apply. Note that Section 1016.3 specifies the measurement of exit access travel distance as being from "the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit," except for open parking garages and outdoor facilities with open access components where it is measured as specified therein. The sections in this proposal, however, specify the measurement of travel distance between points within the exit access (i.e., to an exit access door in Sections 407.4.2, 407.4.3.3, 407.4.3.4 and 407.4.3.5.3; to a smoke barrier door in Sections 407.5, 408.6.1 and 422.3; to an extinguisher in Section 906.2 and Tables 906.3(1) and 906.3(2); etc.).

Changing from "travel distance" to "distance of travel" in these cases is considered to be clarifying and does not change the meaning or the intent of the language. The changes will also be consistent with "distance of travel" in 2012 IBC Sections 402.8.3, 402.8.5 and 415.10.3.3. The other change in Section 2902.5 is grammatical. Based on our analysis of the 2012 IBC, all instances of "travel distance" in the 2012 IBC where a change to "distance of travel" is warranted are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

G71-12
PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.2-G-BRAZIL

G72 – 12
407.4.3, 407.4.3.5 (NEW)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

407.4.3 Group I-2 care suites. *Care suites* in Group I-2 shall comply with Section 407.4.3.1 through ~~407.4.3.4~~ 407.4.3.5 and either Section ~~407.4.3.5~~ 407.4.3.6 or ~~407.4.3.6~~ 407.4.3.7.

407.4.3.5 Doors within care suites. Doors within care suites serving habitable rooms shall be permitted to comply with one of the following:

1. Manually operated horizontal sliding doors permitted in accordance with Exception 9 to Section 1008.1.2.
2. Power-operated doors permitted in accordance with Exception 7 to Section 1008.1.2.
3. Means of egress doors complying with Section 1008.

(Renumber subsequent sections)

Reason: This code proposal is intended to help improve the code by identifying what is permitted for doors installed within Group I-2 care suites.

Within care suites, patient rooms and treatment rooms are generally not required by the IBC to have doors. However, for clinical needs (infection control, privacy, confidentiality, etc.), doors are commonly required within care suites to patient rooms or treatment rooms.

BHMA members are experiencing varying interpretations and code enforcement actions for the doors installed within Group I-2 care suites. The IBC may be considered less than explicitly clear as to what is specifically required, or allowed, for doors installed within Group I-2 care suites.

We realize, from a technical perspective, this proposed language does not add new requirements to the code.

We also realize a user of the IBC could determine what is required and what is not required – and, by default, what is allowed – for doors installed within I-2 care suites. Examples: a door installed in a fire-resistance rated wall would need to be fire-resistance rated (however, doors within I-2 care suites are rarely required to be fire-resistance rated). Similar for smoke partitions. Most doors and doorways in I-2 care suites need to meet egress and accessibility requirements, which is usually a non-issue as these doors and doorways are configured for patient movement by wheelchair and hospital bed.

Unfortunately, BHMA members are experiencing differences in interpretation and application of the code (example: not approving manually operated horizontal sliding doors serving patient sleeping rooms in a care suite) making it difficult to confidently assist building owners, architects, contractors, and other stakeholders with their projects.

With this proposal, we're attempting to provide appropriate guidance as to what is permitted for doors installed within Group I-2 care suites.

Cost Impact: The proposed changes will not increase the cost of construction.

G72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.3.7 (NEW)-G-WOESTMAN

G73 – 12
407.4.3 (NEW), 1005.7.1.2; (IFC [B] 1005.7.1.2)

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Add new text as follows:

407.4.3 Projections in corridors. In Group I-2 nursing homes, where the *corridor* width is a minimum of 96 inches (2440 mm), projections shall be permitted for furniture where all of the following conditions are met:

1. The furniture is attached to the floor or to the wall.
2. The furniture does not reduce the clear width of the *corridor* to less than 72 inches (1830 mm) except where other encroachments are permitted in accordance with Section 1005.7.
3. The furniture is positioned on only one side of the *corridor.*
4. Each arrangement of furniture is 50 square feet (4.6 square meters) maximum in area.
5. Furniture arrangements are separated by 10 feet (3050 mm) minimum.
6. Placement of furniture is considered as part of the fire and safety plans in accordance with Section 1001.4.

Revise as follows:

1005.7.2 (IFC [B] 1005.7.2) Other projections. *Handrail* projections shall be in accordance with the provisions of Section 1012.8. Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width a maximum of 1½ inches (38 mm) on each side.

Exception: Projections are permitted in corridors within Group I-2 nursing homes in accordance with Section 407.4.3.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Many nursing homes have long corridors that residents must traverse. Current interpretation of the IBC precludes the provision of resident seating in nursing home hallways/corridors to assure that egress is unobstructed in the event of an emergency. Residents who are physically unable to traverse the distance without being able to rest periodically have little recourse but use a wheelchair, an outcome counter to maintaining their ambulatory skills.

In addition, changes to facility operations in health care facilities no longer require staff to routinely move residents in beds, coupled with the relatively low occupant load in healthcare facilities, makes 8 ft of clear corridor width often unnecessary.

The primary substantiation to the proposal is as follows:

1. Furniture appropriately placed at defined intervals along hallways/corridors can promote a resident’s ability to maintain his/her highest practical level of functioning and maintain independence. Allowing rest areas (small chairs, benches or grouped seating placed at different points) affords residents the opportunity to walk a distance, rest and then continue independently to their destination, and can enhance resident quality of life and help prevent resident falls and preventable decline in function.
2. In addition to promoting resident independence and mobility, seating placed in hallways/corridors may help to foster social opportunities and create a more homelike environment. Prohibiting such seating areas could diminish opportunities for socialization, and independence. The use of such seating areas will allow resident and staff greater flexibility in choosing safe places to rest.
3. This provision would require that furniture located within the corridor be fixed in place to eliminate the risk that the furniture could be moved into needed egress path. Furniture could be fixed to the floor or wall using a bracket, which would allow removal for maintenance and cleaning purposes.
4. For the fixed furniture, this provision maintains a minimum clear egress width of 6 feet. It also limits the frequency of such furniture groupings so that the 8 ft width is otherwise maintained.
5. This provision also requires that all of the groupings be located to one side of the corridor, so that in an emergency event, the path of travel would be clear on one side of the corridor and zig zagging the corridor would not be required.

Cost Impact: The proposed changes will not increase the cost of construction. There will be a reduction

G73-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.3-G-BALDASSARRA-CTC

G74 – 12
407.4.3.2

Proponent: Lennon Peake, P.E., Koffel Associates, Inc., representing self (lpeake@koffel.com)

Revise as follows:

407.4.3.2 Separation. *Care suites* shall be separated from other portions of the building, including other care suites, by a smoke partition complying with Section 710.

Reason: The existing language only references that care suites must be separated from other portions of the building and could be interpreted that care suites are not required to be separated from each other. The intent of the proposal is to clarify that care suites must be separated from other care suites by a smoke partition especially since Paragraph 407.4.3.1 permits egress through an adjoining suite.

Cost Impact: There is no cost impact as a result of this proposal as it is intended to clarify existing requirements.

G74-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.3.2-G-PEAKE

G75 – 12
407.4.3.6.1

Proponent: Lennon Peake, P.E., Koffel Associates, Inc., representing self (lpeake@koffel.com)

Revise as follows:

407.4.3.6.1 Area. *Care suites* of rooms, other than sleeping rooms, shall have an area not greater than ~~10,000~~ 12,000 square feet (~~929~~ 1 161 m^2).

> **Exception:** *Care suites* not containing sleeping rooms shall be permitted to be not greater than 15,000 sq feet (1 394 m^2) in area where an automatic smoke detection system is provided throughout the *care suite* in accordance with Section 907.

Reason: The 10,000 square ft limitation for care suites not containing sleeping rooms was in Codes before sprinkler protection was required in Group I-2 occupancies. Sprinkler protection provides additional life safety to building occupants which justifies the area increase to 12,500 square ft. Providing an automatic smoke detection system throughout a care suite provides an additional level of life safety which justifies increasing the area to 15,000 sq ft. Sprinkler protection and smoke detection are very effective measures of providing life safety to building occupants address the proposed increase in the area of a care suite not containing sleeping rooms.

Cost Impact: There is not cost impact as a result of this proposal as it allows more options in the design of a suite.

G75-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.4.3.6.1-G-PEAKE

G76 – 12
407.5

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

407.5 Smoke barriers. *Smoke barriers* shall be provided to subdivide every *story* used by persons receiving care, treatment or sleeping and to divide other *stories* with an *occupant load* of 50 or more persons, into no fewer than two *smoke compartments*. Such *stories* shall be divided into *smoke compartments* with an area of not more than 22,500 square feet (2092 m^2)in Group I-2 occupancies and not more than 40,000 square feet in Group I-2 hospitals and the travel distance from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60 960 mm). The *smoke barrier* shall be in accordance with Section 709.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This code change addresses outdated code material. Historically, smoke compartment size has been driven by the allowable travel distance within the smoke compartment. Past code changes have increased the travel distance without a corresponding change in smoke compartment size. Secondly, the size of the functional patient areas has increased, but the occupant load has remained the same or has been reduced. Therefore, we are asking for an increase in smoke compartment size to accommodate the operational needs of the modern hospital.

A summary of the history of smoke compartment requirements is as a requirement is as follows:

- October 1984 BCMC – Maximum length and width equals 150 feet.
- 1987 BOCA – 610.5 – Maximum length and width equals 150 feet
- 1992 BOCA Supplement – 610.4 – 22,500 square feet, with maximum travel distance of 150 feet.
- Code Change No. B20-95 – 22,500 square feet, with maximum travel distance proposed to be increased to 200 feet.
- 1996 BOCA – 409.4 - 22,500 square feet, with maximum travel distance of 200 feet.
- 2000 IBC – 407.4 - 22,500 square feet, with maximum travel distance of 200 feet.

Originally, there was no limit to smoke compartment size, other what was imposed by travel distance. The 22,500 square foot requirement was based on the old travel distance requirement of 150 feet, and used it to extrapolate an area (150ft x150ft = 22,500 square feet). This proposal uses the same logic and applies the current 200 foot travel distance maximum (200ft x200ft), resulting in a 40,000 square foot smoke compartment. This proposal would maintain the existing requirement that each floor be divided into two smoke compartments. Practically the requirement for 200' travel distance within smoke compartments will still drive smaller smoke compartment sizes in some cases.

Over the past 20 years, there has been a steady increase in the size of patient treatment rooms in hospitals. The primary reason for the increase is the equipment and utilities necessary for the treatment of a patient, such as patient monitoring, gases, and diagnostics equipment, while maintaining space for staff access to the patient. In response, the widely adopted and enforced "*Guidelines for the Design and Construction of Health Care Facilities"* from the FGI Institute have also increased, making these operational considerations actual code requirements. In the case of the inpatient units, the adoption of a single bed in a patient room has had the largest impact on square footage, while not significantly increasing the number of occupants on the unit.

The concept of an "individual patient space" is becoming the standard design in other types throughout the hospital. Many emergency departments are opting for private patient exam spaces with hard walls, primarily for infection control and patient privacy considerations. Similarly, radiology areas are being driven by technology and clearance issues which go beyond the required minimums, and have impacts on square footages to achieve clearances. In some units, there has also been an increase in the types of required support spaces, including ratios of equipment storage per treatment room, the increased importance of computer equipment rooms, and various staff areas. However, support spaces have remained largely the same, while the main increases have been in the size of the patient treatment areas themselves. While these spaces have been increasing in size, the smoke compartment size requirements have been left unchanged in the building codes.

When studying the contemporary sizes of functions such as emergency departments, radiology operations, and bed units, the larger size allows for greater visualization from the staff to the patient, which is a crucial aspect of planning a patient area. This operational consideration could more easily be achieved before the increase in patient areas, but the same operational considerations require an increase to the smoke zone size to match contemporary requirements, delivery of care and technologies. Attached is a study of space programs which compare the 2010 Guideline requirements with the 1996-97 Guidelines. In short, today's hospital takes more square footage to care for the same amount of patients. These programs demonstrate the need to increase to 40,000 square foot smoke compartment. See program analysis at the following link.
http://www.iccsafe.org/cs/AHC/Pages/WG-General.aspx

Cost Impact: This proposal will help to decrease the cost of construction. Increasing the compartment size will reduce the number of smoke and fire dampers and lifetime maintenance costs could proportionately decrease.

G76-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.5-G-Williams-Adhoc

G77 – 12

IBC 407.9 (NEW), IFC 604.2.1.6 (NEW) [IBC [F] 2702.2.17 (NEW)]

Proponent: Robert W. Jenkins, Chesterfield Fire & EMS, representing self (jenkinsr@chesterfield.gov)

Add new text as follows:

407.9 Emergency power. A minimum of 96-hours of emergency power shall be provided to the essential electrical systems in Group I-2 hospitals and nursing homes. Emergency power shall be connected to the life safety branch and the critical branch defined in NFPA 70, and further defined as emergency power supply systems in Chapter 4 of NFPA 110.

Add new text as follows:

IFC 604.2.16 (IBC [F] 2702.2.17) Group I-2 Occupancies. Emergency power shall be provided in Group I-2 hospitals and nursing homes in accordance with Section 407.9 of the *International Building Code*.

Reason: Group I-2 facilities are defend in place occupancies where occupants are usually not relocated. NFPA 110, Chapter 5 requires 96-hours of fuel supply for a Level 1 EPSS Class X system when located in seismic design category C, D, E or F. Time frames for emergency power supplies need to be adjusted to allow facilities adequate time to maintain fuel supplies to secondary power sources. Our jurisdiction has had a power loss for several days due primarily to hurricane remnants on the east coast, such as hurricane Isabel in 2003. Power was not restored to several areas from as little as five days to a maximum of 30-days.

Cost Impact: The code change proposal will increase the cost of construction. Cost increase will be incurred due to additional fuel storage requirements and/or type of secondary sources.

G77-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2702.2.17 (NEW)-G-JENKINS.doc

G78 – 12
407.10

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

SECTION 425
HYBERBARIC FACILITIES

~~407.10~~ 425.1 Hyperbaric facilities. Hyperbaric facilities ~~in Group I-2 occupancies~~ shall meet the requirements contained in Chapter 20 of NFPA 99.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and asses' contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx
This code change expands the scope of an existing requirement to include all of the occupancies that have hyberbaric chambers installed.
Hyperbaric chambers are used in multiple occupancy types, not just Group I-2. Most of the typical patients that use these devices are outpatients, and are typically housed in Group B occupancies. As the popularity of these devices increase, *these are showing up in residential settings as well*. This proposal would increase the scope of these requirements to anywhere a hyperbaric chamber is seen.

Cost Impact: This change will increase the cost of construction for facilities that are not currently federally certified.

G78-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.9-G-Williams-Adhoc

G79 – 12
407.11 (NEW)

Proponent: Lynn W. Manley, Illinois Department of Public Health - Health Care Facilities and Programs, representing self (lynn.manley@illinois.gov)

Add new text as follows:

407.11 Residential Cooking Appliances. Residential type cooking appliances that include: griddles, stoves, range tops, electric skillets, portable gas fired burners and portable cooking device shall not be permitted in hospitals.

Exceptions:

1. Cooking installations that are approved by all applicable authorities having jurisdiction and that are installed with a commercial cooking hood and protected with a hood suppression system in accordance with Section 904.11 of the International Fire Code shall be permitted. In no case shall any cooking operation be permitted in a space that is open to a corridor.
2. Residential appliances that are provided for training purposes as part of a hospital program shall be permitted under the following conditions:
   - 2.1. A detailed program narrative must be provided and maintained that includes all safety issues, and indicates when and how the appliance may be used for training purposes.
   - 2.2. The appliance must be located within a training room that is separated from other non-related spaces and from corridors by smoke partitions constructed in accordance with Section 710. Such training room shall be separated from any patient sleeping area by a smoke barrier.
   - 2.3. The appliance is used only under direct supervision of trained hospital personnel and shall have safety devices to prevent unauthorized use.
   - 2.4. A kitchen hood suppression system shall not be required.
   - 2.5 A Type K portable fire extinguisher is required in the room within easy reach of the cooking appliance.
3. Microwave ovens, warming plates that are designed for warming and not cooking, ovens and other appliances that do not produce any airborne grease laden vapors shall be permitted in spaces that are separated from corridors by smoke partitions constructed in accordance with Section 710.

Reason: If any staff person or visitor in hospital wants to eat, they can easily go to the vending areas, cafeteria and/or café type food services that are typically available.

Food for patients is prepared and provided in commercial food preparation facilities (catered or prepared on site by trained staff). Patient food service is under the supervisions of a dietician. Most patients would not be permitted to eat anything that was not approved by the dietician.

The history and statistical data for cooking fires in residential construction, for fires in fire departments and for fires in restaurants with or without hood suppression systems is well documented. There are simply too many every year. Hospitals continue to have small fires in microwaves, toasters, etc. and occasionally have a fire in a commercial cooking appliance. The outcome of such events is minimal because of the level of staff training during a fire event, and because any of the real fire hazards are controlled by suppression systems that are maintained in accordance with national standards. Also, fire and smoke migration in hospitals is limited by the extensive compartmentation that is required.

The need to clarify the use of minor warming appliances and to identify use of residential appliances for training purposes is justified. However, there is no justification to allow residential stoves in hospitals, except as indicated above and any proposal to allow cooking appliances in spaces open to corridors goes in the face of the historical evidence that clearly indicates fires will result and loss of life of more than one person would be likely.

This change is proposed as part of the requirements for new hospitals and should result in conditions that are safer or at least no less safe than previous requirements. This proposal recognizes that other code changes may be proposed in this cycle to allow cooking in areas open to corridors and that a code change proposal to separate the requirements from Hospitals from the requirements for Nursing Homes also may be proposed in this cycle. If there is a demand to create exceptions in nursing homes, then the requirements should be justified under a separate section for nursing homes that allows the requirements for hospital and nursing homes to be considered separately.

Cost Impact: There will be no cost impact. The above changes are already implemented in many jurisdictions. The code change is needed for clarification and could reduce costs where jurisdictions have required commercial cooking hoods and suppression in

Hospitals where residential equipment is used for patient rehabilitation and training purposes. We are unaware of any fires that have occurred on residential stoves used only for training purposes.

G79-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.11-G-MANLEY

G80 – 12
407.11

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Add new text as follows:

407.11 Electrical systems. In Group I-2 occupancies, the essential electrical power for electrical components, equipment and systems shall be designed and constructed in accordance with the provisions of Chapter 27 and NFPA 99.

Add new text as follows:

[F] 2702.2.16 Group I -3 Occupancies. Essential electrical power for Group I-2 occupancies shall be in accordance with Section 407.11.

Reason: Currently emergency power systems are required to comply with NFPA 99 by the Center for Medicare/Medicaid Services (CMS) in order for a facility to receive federal reimbursement funds. Providing the code language requiring compliance with NFPA 99 will ensure the required power system is provided in Group I-2 occupancies. While there is a reference to NFPA 99 in NFPA 70, there is no direct reference. This closes up a gap in the requirements. A reference to Chapter 27 will comprehensively address electrical systems including references to NFPA 70, 110 and 111.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

Cost Impact: The proposed changes will not increase the cost of construction.

G80-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

407.11-G-Williams-Adhoc

G81 – 12
408.3.9 (New)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering, (al.godwin@aon.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

408.3.9 Door penetrations. When cell walls are also the corridor walls, cell doors are permitted to have openings necessary to observe, communicate, feed or otherwise interact with the inmate.

Reason: In the case of maximum security confinement or medical security confinement, with individual cells, an access opening through the door is not uncommon. To require such opening to be protected and/or self closing is not realistic.

Cost Impact: This code change proposal will not increase the cost of construction.

G81-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

408.3.9 (NEW)-G-GODWIN

G82 – 12
408.9

Proponent: Ray Grill, P.E., Arup, representing self (Ray.Grill@arupgp.com)

Revise as follows:

408.9 Windowless buildings. For the purposes of this section, a windowless building or portion of a building is one with nonopenable windows, windows not readily breakable or without windows. To facilitate smoke removal in post-fire salvage and overhaul operations, windowless buildings shall be provided with ~~an engineered smoke control system to provide a tenable environment for exiting from the *smoke compartment* in the area of fire origin in accordance with Section 909~~ mechanical ventilation for each windowless *smoke compartment*~~.~~ in accordance with one of the following:

1. Mechanical air-handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
2. Any other *approved* design that will produce equivalent results.

Reason: The current code language is vague and does not provide practical design criteria. The requirement for ventilation is applicable to areas of a building that cannot be ventilated with windows. Ventilation of products of combustion via windows is typically done during post-fire salvage operations and not to maintain tenable egress conditions.

The proposed criteria is consistent with the code provisions for smoke control of high rise buildings.

Cost Impact: This code change proposal will not increase the cost of construction.

G82-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

408.9-G-GRILL

G83 – 12
410.3.5

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Won-Door Corporation (wkoffel@koffel.com)

Revise as follows:

410.3.5 Proscenium curtain. Where a proscenium wall is required to have a fire-resistance rating , the stage opening shall be provided with a fire curtain complying with NFPA 80, a horizontal sliding doors having a fire protection rating of at least one hour, or an approved water curtain complying with Section 903.3.1.1 or, in facilities not utilizing the provisions of smoke-protected assembly seating in accordance with Section 1028.6.2, a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level at least 6 feet (1829 mm) above the floor of the means of egress

Reason: Horizontal sliding doors can be used to protect proscenium openings without interfering with the operational considerations of the proscenium opening. A horizontal sliding door with a fire protection rating of at least one hour offers a level of protection greater than that provided by a fire curtain which is tested for a fire exposure of 30 minutes and the acceptance criteria does not include either the hose stream (included in the fire test for horizontal sliding doors or temperature rise criteria which is also not included in a fire protection rating).

Cost Impact: The proposed changes will not increase the cost of construction.

G83-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.3.5-G-KOFFEL

G84 – 12
410.3.6, 424.2, 3102.3, 3102.3.1, 3102.6.1.1, 3105.4, D102.2.8

Proponent: Marcelo Hirschler GBH International, representing self

Revise as follows:

410.3.6 Scenery. Combustible materials used in sets and scenery shall meet the fire propagation performance criteria of <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701, in accordance with Section 806 and the *International Fire Code*. Foam plastics and materials containing foam plastics shall comply with Section 2603 and the *International Fire Code*.

424.2 Materials. Children's play structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. through 4. *(no change)*
5. Textiles and films complying with the ~~flame~~ <u>fire</u> propagation performance criteria contained in <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701.
6. through 7. *(no change)*
8. Foam plastics shall be covered by a fabric, coating or film meeting the ~~flame~~ <u>fire</u> propagation performance criteria <u>contained in Test Method 1 or Test Method 2, as appropriate,</u> of NFPA 701.
9. *(no change)*

3102.3 Type of construction. Noncombustible membrane structures shall be classified as Type IIB construction. Noncombustible frame or cable-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IIB construction. Heavy timber frame-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IV construction. Other membrane structures shall be classified as Type V construction.

> **Exception:** Plastic less than 30 feet (9144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701.

3102.3.1 Membrane and interior liner material. Membranes and interior liners shall be either noncombustible as set forth in Section 703.5 or meet the fire propagation performance criteria of <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701 and the manufacturer's test protocol.

> **Exception:** Plastic less than 20 mil (0.5 mm) in thickness used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701.

3102.6.1.1 Membrane. A membrane meeting the fire propagation performance criteria of <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701 shall be permitted to be used as the roof or as a skylight on buildings of Types IIB, III, IV and V construction, provided it is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

3105.4 Canopy materials. *Canopies* shall be constructed of a rigid framework with an *approved* covering that meets the fire propagation performance criteria of <u>Test Method 1 or Test Method 2, as appropriate, of</u> NFPA 701 or has a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

D102.2.8 Permanent canopies. Permanent canopies are permitted to extend over adjacent open spaces provided all of the following are met:

1. The canopy and its supports shall be of noncombustible material, *fire-retardant-treated wood*, Type IV construction or of 1-hour fire-resistance-rated construction.

   Exception: Any textile covering for the canopy shall meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 ~~be flame resistant as determined by tests conducted in accordance with NFPA 701~~ after both accelerated water leaching and accelerated weathering.

2. Any canopy covering, other than textiles, shall have a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723 in the form intended for use.
3. The canopy shall have at least one long side open.
4. The maximum horizontal width of the canopy shall not exceed 15 feet (4572 mm).
5. The *fire resistance* of *exterior walls* shall not be reduced.

Reason: There is an additional issue, as discussed below and that addresses the potential for providing misleading test results.

In 1989 the NFPA Technical Committee on Fire Tests eliminated the so-called "small-scale test" from NFPA 701 because the results had been shown not to represent a fire performance that corresponded to what happened in real scale. Instead of the "small-scale test" NFPA 701 now (and for over 20 years) contains two tests (Test 1 and Test 2), which apply to materials as indicated by the text of NFPA 701 (2010) that is shown at the bottom of this proposal.

However, a large number of manufacturers continue stating that the materials or products that they sell have been tested to NFPA 701, when they really mean the pre-1989 small-scale test in NFPA 701. That test no longer exists and materials or products meeting that test do not exhibit acceptable fire performance.

Text of NFPA 701 (2010):

1.1.1.1 Test Method 1 shall apply to fabrics or other materials used in curtains, draperies, or other window treatments. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.

1.1.1.2 Test Method 1 shall apply to single-layer fabrics and to multilayer curtain and drapery assemblies in which the layers are fastened together by sewing or other means. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.

1.1.1.3 Test Method 1 shall apply to specimens having an areal density less than or equal to 700 g/m^2 (21 oz/yd^2), except where Test Method 2 is required to be used by 1.1.2.

1.1.2.1 Test Method 2 (flat specimen configuration) shall be used for fabrics, including multilayered fabrics, films, and plastic blinds, with or without reinforcement or backing, with areal densities greater than 700 g/m^2 (21 oz/yd^2).

1.1.2.2 Test Method 2 shall be used for testing vinyl-coated fabric blackout linings and lined draperies using a vinyl-coated fabric blackout lining.

1.1.2.3 Test Method 2 shall be used for testing plastic films, with or without reinforcement or backing, when used for decorative or other purposes inside a building or as temporary or permanent enclosures for buildings under construction.

1.1.2.4 Test Method 2 shall apply to fabrics used in the assembly of awnings, tents, tarps, and similar architectural fabric structures and banners.

Note also the following from the text of NFPA 701 (2010):

1.2* Purpose.

1.2.1 The purpose of Test Methods 1 and 2 shall be to assess the propagation of flame beyond the area exposed to the ignition source.

A.1.1 A small-scale test method appeared in NFPA 701 until the 1989 edition. It was eliminated from the test method because it has been shown that materials that "pass" the test do not necessarily exhibit a fire performance that is acceptable. The test was not reproducible for many types of fabrics and could not predict actual full-scale performance. It should not, therefore, be used.

A.1.1.1 For the purposes of Test Method 1, the terms curtains, draperies, or other types of window treatments, where used, should include, but not be limited to, the following items:

(1) Window curtains
(2) Stage or theater curtains
(3) Vertical folding shades
(4) Roll-type window shades
(5) Hospital privacy curtains
(6) Window draperies
(7) Fabric shades or blinds
(8) Polyvinyl chloride blinds
(9) Horizontal folding shades
(10) Swags

Examples of textile items other than window treatments to which Test Method 1 applies include:

(1) Table skirts
(2) Table linens
(3) Display booth separators
(4) Textile wall hangings
(5) Decorative event tent linings not used in the assembly of a tent

In addition to the clarification of the test criteria of NFPA 701 two additional revisions are proposed as follows:

- Section 424.2 has been revised to use the terminology "fire propagation" versus "flame propagation" to be consistent with all other references to NFPA 701 in the IBC.

- Section D102.2.8 was revised to remove “flame resistant” terminology. Throughout the ICC set of codes, the references to NFPA 701 have been revised to be more precise and address “fire propagation performance criteria of NFPA 701” rather than talk about “flame resistant” or “flame retardant”. NFPA 701 does not measure whether a material or product is “flame resistant” or “flame retardant” but whether it meets its “fire propagation performance criteria”. Apparently I missed this section.

Cost impact: This code change proposal will increase the cost of construction, but only minimally.

G84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

424.2-G-Hirschler.doc

G85 – 12

202, 410.6.2, 1015.2.1 (IFC [B] 1015.2.1), 1022.7 (IFC [B] 1022.7), 3007.7.1

Proponent: Philip Brazil. PE, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development (pbrazil@reidmiddleton.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

EXIT ACCESS DOORWAY. A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, *corridor*, *exit access stair*<u>*way*</u> or *exit access ramp*.

Revise as follows:

410.6.2 Stairway and ramp enclosure. *Exit access stairways* and *ramps* serving a *stage* or *platform* are not required to be enclosed. *Exit access stairways* <u>and *ramps*</u> serving *technical production areas* are not required to be enclosed.

Revise as follows:

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways. Where two *exits* or *exit access doorways* are required from any portion of the *exit access*, the *exit* doors or *exit access doorways* shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between *exit* doors or *exit access doorways*. Interlocking or *scissor stairs* shall be counted as one *exit stairway*.

Exceptions:

1. Where *interior exit stairways* <u>or *ramps*</u> are interconnected by a 1-hour fire-resistance-rated *corridor* conforming to the requirements of Section 1018, the required *exit* separation shall be measured along the shortest direct line of travel within the *corridor*.
2. Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the *exit* doors or *exit access doorways* shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

1022.7 (IFC [B] 1022.7) Interior exit stairway and ramp exterior walls. *Exterior walls* of the *interior exit stairway* ~~and~~ <u>or</u> *ramp* shall comply with the requirements of Section 705 for exterior walls. Where nonrated walls or unprotected openings enclose the exterior of the *stairway* <u>or *ramp*</u> and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building *exterior walls* within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a *fire-resistance rating* of not less than 1 hour. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the *stairway* <u>or *ramp*</u> or to the roof line, whichever is lower.

Revise as follows:

3007.7.1 Access. The fire service access elevator lobby shall have direct access to an enclosure for an *interior exit stairway* <u>or *ramp*</u>.

Reason: The addition of “ramp(s)” is for consistency with “exit access stairway or ramp,” “interior exit stairway or ramp” and “stairway or ramp” throughout the 2012 IBC, where applicable, which was established with the approved changes from Proposal E5-09/10-AS. In the definition of “exit access doorway” in Section 202, the change from “stair” to “stairway” is for consistency with the use of “exit access stairway” for the same reason. In Section 1022.7, the change from “and” to “or” is grammatical. Based on our analysis of the 2012 IBC, there are no other instances of “exit access stairway” or “interior exit stairway” where the addition of “ramp(s)” is warranted.

Cost Impact: The code change proposal will not increase the cost of construction.

G85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.6.2-G-BRAZIL

G86 – 12
412.3, 412.3.1, 412.3.2, Table 412.3.2, 412.3.3, 412.3.4, 412.3.5

Proponent: Eric Rosenbaum, Hughes Associates, Inc., representing Air Traffic Control Tower Fire Life Safety Task Group (erosenbaum@haifire.com)

Revise as follows:

412.3 Airport traffic control towers. The provisions of Sections 412.3.1 through 412.3.~~5~~11 shall apply to airport traffic control towers ~~not exceeding 1,500 square feet (140 m^2) per floor~~ occupied only for the following uses:

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.

412.3.1 Type of construction. Airport traffic control towers shall be constructed to comply with the height ~~and area~~ limitations of Table 412.3.2.

TABLE 412.3.2
HEIGHT ~~AND AREA~~ LIMITATIONS FOR AIRPORT TRAFFIC CONTROL TOWERS

TYPE OF CONSTRUCTION	HEIGHT[a] (feet)	~~MAXIMUM AREA (square feet)~~
IA	Unlimited	~~1,500~~
IB	240	~~1,500~~
IIA	100	~~1,500~~
IIB	85	~~1,500~~
~~IIIA~~	~~65~~	~~1,500~~

a. Height to be measured from grade plane to cab floor

412.3.2 Stairway Stairways in Airport traffic control towers shall conform to the requirements of Section 1009. Such *stairways* shall be a smokeproof enclosure in accordance with Section 909.20. The stair pressurization alternative in accordance with Section 909.20.5 shall be permitted to be used. *Stairways* shall not be required to extend to the roof as specified in Section 1009.11.

412.3.3 Exit access. From observation levels, airport traffic control towers shall be permitted to have a single means of exit access for a distance of travel not exceeding 100 ft (30 m). This means of egress shall be permitted to include exit access utilizing an unenclosed stair at the observation level.

~~412.3.2~~ 412.3.4 Single means of egress. Not less than one *exit stairway* shall be permitted for airport traffic controls towers of any height provided that the *occupant load* per floor is not greater than 15 and the area per floor does not exceed 1,500 square feet (140 m^2). ~~The *stairway* shall conform to the requirements of Section 1009. The *stairway* shall be separated from elevators by a minimum distance of one-half of the diagonal of the area served measured in a straight line. The *exit stairway* and elevator hoist-way are permitted to be located in the same shaft enclosure, provided they are separated from each other by a 4-hour *fire barrier* having no openings. Such *stairway* shall be pressurized to a minimum of 0.15 inch of water column (43 Pa) and a maximum of 0.35 inch of water column (101 Pa) in the shaft relative to the building with stairway doors closed. *Stairways* need not extend to the roof as specified in Section 1009.11. The provisions of Section 403 do not apply.~~

> ~~**Exception:** Smokeproof enclosures as set forth in Section 1022.9 are not required where required *stairways* are pressurized.~~

412.3.4.1 Arrangement of single means of egress. Airport traffic control towers permitted a single exit and located above another building shall be provided with one of the following:

1. Exit enclosure separated from the other building with no door openings to or from the other building
2. Exit enclosure leading directly to an exit enclosure serving the other building, with walls and door separating the exit enclosures from each other, and another door allowing access to the top floor of the building that provides access to a second exit serving that floor.

412.3.4.2 Interior Finish. Airport traffic control towers permitted a single exit in accordance with Section 412.3.4 shall be restricted to interior wall and ceiling finishes of Class A or Class B.

~~412.3.3~~ 412.3.5 Automatic fire detection systems. Airport traffic control towers shall be provided with an automatic fire detection system installed in accordance with Section 907.2.

412.3.6 Automatic sprinkler system. Airport traffic control towers shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~412.3.4~~ 412.3.7 Standby power. A standby power system that conforms to Chapter 27 shall be provided in airport traffic control towers more than 65 feet (19 812 mm) in height. Power shall be provided to the following equipment:

1. Pressurization equipment, mechanical equipment and lighting.
2. Elevator operating equipment.
3. Fire alarm and smoke detection systems.

412.3.8 Elevator Protection. Wires or cables that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to elevators shall be protected by construction having a minimum 1-hour *fire resistance rating* or shall be circuit integrity cable having a minimum 1-hour *fire-resistance rating*.

~~412.3.5~~ 412.3.9 Accessibility. Airport traffic control towers need not be *accessible* as specified in the provisions of Chapter 11

Reason: All of the proposed changes are the recommendation of the Air Traffic Control Tower Fire Life Safety Task Group, and reflect the current approach to fire protection and life safety in airport traffic control towers (ATCT). The fire safety criteria applicable to ATCTs are originally based on an agreement between the operator of and controllers utilizing the ATCTs. Many of the changes relate to reformatting the Section with the intent of clarifying its application.

ATCTs create a unique hazard. ATCTs typically have a limited number of occupants. In addition, occupants must be awake and alert. The hazard associated with ATCTs is affected by the building's limited uses, height, and the potential delay in evacuation because of the handoff of flights .

Section 412.3-The provision of a maximum area per floor of 1,500 square feet limits the usage of the facility without providing significant Fire/Life Safety benefit in Airport Traffic Control Towers with multiple exits. The 1,500 square foot maximum area provisions are proposed to be relocated to restrict the floor size only for single exit towers. It is proposed that facilities in excess of 1,500 square feet per floor would be considered a ATCT only if the uses are limited to those listed in Section 412.3. Facilities with uses other than those listed in Section 412.3 would need to be designed as a typical building as addressed by the remainder of the IBC.

Table 412.3.1-The proposed provisions to limit construction to non-combustible types is presented because the use of combustible construction for a new ATCT allows the introduction of a potential unnecessary hazard developing within the construction without observation. We are not aware of new ATCT utilizing combustible construction.

Section 412.3.2-This change creates a new section containing criteria applicable to stairways for clarity. Most of the criteria were relocated from the existing Section 412.3.2, **Egress**. The current specified pressure differential required by Section 412 does not coordinate with Chapter 9 and the current approaches, a pressure differential of a minimum of 0.10 inches of water. In addition, instead of requiring a smoke proof enclosure by stair pressurization all options are identified as acceptable for providing a smoke proof enclosure.

Section 412.3.3-This section provides new criteria applicable to egress from observation levels. Obstruction related to enclosed stairs would eliminate the ability to provide sightlines. In addition, the reduction in area to allow two stairs to this level would affect operations. The proposed maximum exit access travel distance provision is intended to address exit access from the cab, where a single access stair is provided to allow maximum floor usage and maintain 360 degree line-of-sight requirements. A single exit access stair is typically provided from the observation level with the exit originating on the floor below the observation level. The proposed provision limits travel distance before reaching an exit/exits and is based on the common path of travel limitations established under Chapter 10.

Section 412.3.4- Many of the changes relate to relocations to or from other sections. In addition, the separation distance criteria of the stair to an elevator and fire resistance rating of the shafts is proposed to be removed. Elevators are not typically utilized as a means of egress unless specifically design such as Occupant Evacuation Elevators, Section 3008. If designed as a means of egress the criteria for separation distance of exits in Chapter 10 would potentially apply. Shaft enclosure criteria in Chapter 7 addresses fire resistance rated separation of shafts sufficiently.

Section 412.3.4.1-The proposed provision limiting single stair exit arrangement is intended to provide increased Fire/Life Safety when Airport Traffic Control Towers are built above other buildings. In this scenario, separated exit enclosures are required to protect occupants from the Airport Traffic Control Tower where delayed evacuation of the cab may be required.

Section 412.3.4.2-The proposed restriction on interior finish in a single exit stair Airport Traffic Control Tower is intended to increase Fire/Life Safety by limiting flame spread and smoke production which have a higher probability of impinging on the means of egress in single stair facilities.

Section 412.3.6-The proposed provision requiring sprinkler protection in all Airport Traffic Control Towers is intended to increase life safety and property protection. Life safety is positively affected by limiting the chance of smoke/fire spread and flashover in the facility where delayed evacuation of the cab may be required. In addition, property protection to allow sooner reuse of the structure would be provided.

Section 412.3.8-The proposed provision requiring protection of elevator wiring and cabling is to increase the probability of a functioning elevator to aid firefighters in the event of a fire and to increase the probability that the facility can be rapidly returned back to service after a minor fire incident.

Section 412.3.9 - No change from current criteria. ATCTs are exempt from accessibility criteria in Section 412.3.5.

Cost Impact: This code change will increase the cost of construction from the current code requirements; however, reflects current building practices of ATCTs.

G86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

412.3-G-ROSENBAUM

G87 – 12

412.7 (NEW), Table 412.7 (NEW), 412.7.1 (NEW), Table 1016.2 (IFC [B] Table 1016.2)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com), Jay Wallace, The Boeing Company (jay.s.wallace@boeing.com)

Add new text as follows:

412.7 Aircraft manufacturing facilities. In buildings used for the manufacturing of aircraft, exit access travel distances indicated in Section 1016.1 shall be increased in accordance with the following:

1. The building shall be of Type I or II construction.
2. Exit access travel distance shall not exceed the distances given in Table 412.7.

TABLE 412.7
AIRCRAFT MANUFACTURING EXIT ACCESS TRAVEL DISTANCE

HEIGHT (feet) [b]	MANUFACTURING AREA (sq. ft.) [a]					
	≥150,000	≥200,000	≥250,000	≥500,000	≥750,000	≥1,000,000
≥ 25	400	450	500	500	500	500
≥ 50	400	500	600	700	700	700
≥75	400	500	700	850	1,000	1,000
≥ 100	400	500	750	1,000	1,250	1,500

For SI: 1 foot = 304.8 mm

a. Contiguous floor area of the aircraft manufacturing facility having the indicated height.

b. Minimum height from finished floor to bottom of ceiling or roof slab or deck.

412.7.1 Ancillary areas. Rooms, areas and spaces ancillary to the primary manufacturing area shall be permitted to egress through such area having a minimum height as indicated in Table 412.7. Exit access travel distance within the ancillary room, area or space shall not exceed that indicated in Table 1016.1 based on the occupancy classification of that ancillary area. Total exit access travel distance shall not exceed that indicated in Table 412.7.

Revise as follows:

TABLE 1016.2 (IFC [B] TABLE 1016.2)
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b]
I-1	Not Permitted	250[c]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[c]
H-2	Not Permitted	100[c]
H-3	Not Permitted	150[c]
H-4	Not Permitted	175[c]
H-5	Not Permitted	200[c]
I-2, I-3, I-4	Not Permitted	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to *exit access* travel distance requirements:
Section 402.8: For the distance limitation in *malls*.
Section 404.9: For the distance limitation through an *atrium* space.

Section 407.4: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
Section 411.4: For the distance limitation in special amusement buildings.
Section 412.7: For the distance limitations in aircraft manufacturing facilities.
Section 1015.4: For the distance limitation in refrigeration machinery rooms.
Section 1015.5: For the distance limitation in refrigerated rooms and spaces.
Section 1021.2: For buildings with one *exit*.
Section 1028.7: For increased limitation in assembly seating.
Section 1028.7: For increased limitation for assembly open-air seating.
Section 3103.4: For temporary structures.
Section 3104.9: For pedestrian walkways.

b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason: Supporting technical data are available for review at http://www.boeing.com/nosearch/tds/.

Many aircraft manufacturing buildings are unusually large due to the size of the commercial or military aircraft being produced. For instance, an assembled Boeing 747 has a tail height of over 63 feet. The rectangular footprint of a Boeing 747-800 is over 56,000 square feet.

Group F-1 occupancies greater than 150,000 square feet in floor area can have difficulty complying with 250 foot, sprinklered exit access travel distance limitations without incorporating exit passageways or horizontal exits into the design of the building means of egress system. The use of either exit component is somewhat problematic. Due to the compartmentalized nature of horizontal exits, they do not lend to aircraft production processes or movement of the finally assembled aircraft. For similar reasons, exit passageways are generally installed below the floor of the assembly level. The use of underground exit passageways during an emergency in a very high volume space is generally contrary to human nature. Once aware of an event, employees would instinctively evacuate the building at the level with which they are most familiar. Also, it is relatively easy to move away from the point of origin of a fire due to a person's sensory awareness within the entire open space. Given the fact that occupants sense safety as they move away from the fire, it is counter-intuitive to enter an underground area unless as a last resort.

Regardless of human nature and logic, it must be demonstrated that large volume spaces provide a tenable environment for the evacuation or relocation of building occupants. Prior to the technical justification of this proposal, it should be noted that during the previous code development cycle, The Boeing Company submitted Item E109-09/10, that was intended to allow for increased travel distances in large volume aircraft manufacturing buildings. To support its proposal, Boeing conducted smoke and temperature fire modeling using the NIST FDS (National Institute of Standards and Technology - Fire Dynamics Simulator) computer program. Boeing correlated initial model fire data to an actual burn test conducted at a certified test facility in Washington State.

The ICC Means of Egress Code Committee disapproved the proposal. This proposal is virtually identical to the previous submittal. In its published reason statement for disapproval, the committee stated, "Boeing should be commended for their fire model analysis on this issue." The primary concern of the committee was that Boeing had not obtained a third party peer review in accordance with The American Society of Fire Protection Engineers protocol. Additionally, several questions were asked about Boeing modeling assumptions. The Boeing Company obtained the services of Arup, a widely renowned design and consulting firm to perform a peer review. Arup reviewed the committee comments and provided Boeing with a revised set of parameters for new modeling runs. Based on the results of the additional modeling runs, Arup developed a report validating the proposed travel distances. During testimony at the final action hearings in Charlotte, NC, several Means of Egress Code Committee members testified that Boeing had addressed their concerns and recommended approval of the code change. During testimony, one individual expressed that a centrally located fire could produce more severe results. Based on this created doubt, the item failed to achieve the necessary 2/3 majority by a handful of votes. Since that disapproval, additional modeling has been performed based on a centrally located event origin. The results further validated the proposed code change. Resubmitted for this code development cycle, there is only one significant change to the proposal. That is with the location of the provision. Previously, it was proposed to be located in Section 1016. Given the very specific nature of the provision--that is, it is applicable only to large volume aircraft manufacturing facilities--it has been located in Section 412, Aircraft-Related Occupancies.

Since this is a re-submittal of a previous proposal, supporting technical data are extensive and could overwhelm this reason statement. Therefore, background information is provided in chronological order at a Boeing website: http://www.boeing.com/nosearch/tds/. Included are: the original proposed code change E109-09/10 with a comprehensive reason statement, initial supporting modeling data, the Means of Egress Code Committee's reason for disapproval, revised modeling data based on committee comment, the Arup peer review, Boeing's public comment for approval as submitted at the final action hearings and further modeling data based on comment at the final action hearings.

In summary, the unique size of some aircraft manufacturing facilities inherently provides a tenable environment for building occupants as they travel to an exit. It is logical that spaces with higher ceilings provide for a greater level of occupant tenability than those with lower ceilings. Rather than arbitrarily selecting travel distance values based on former provisions or attempting an educated guess, The Boeing Company conducted computer modeling based on conservative assumptions in order to determine acceptable travel distances. This proposal has been extensively vetted over the previous code development cycle. Boeing has responded to every technical concern by performing additional modeling runs and obtaining a third party peer review. All additional research and review has only further validated the initial assumptions and conclusions. Approval of this proposal will acknowledge means of egress design issues associated with large area, high volume aircraft manufacturing spaces while providing a high degree of occupant safety during egress from such buildings.

Cost Impact: The proposed changes will not increase the cost of construction.

G87-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

412.7 (NEW)-G-KEITH-WALLACE

G88 – 12
[F] 415.8.1.7 (New) (IFC 3403.2)

Proponent: Barry Gupton, PE, representing NC Department of Insurance (NCDOI), Office of State Fire Marshal (OSFM), Engineering Division (barry.gupton@ncdoi.gov)

Add new text as follows:

[F] 415.8.1.7 (IFC 3403.2) Tire rebuilding. Buffing operations shall be located in a room separated from the remainder of the building housing the tire rebuilding or tire recapping operation by a 1-hour *fire barrier*.

> **Exception:** Buffing operations are not required to be separated where all of the following conditions are met:
>
> 1. Buffing operations are equipped with an *approved* continuous automatic water-spray system directed at the point of cutting action;
> 2. Buffing machines are connected to particle-collecting systems providing a minimum air movement of 1,500 cubic feet per minute (cfm) (0.71 m^3/s) in volume and 4,500 feet per minute (fpm) (23 m/s) in-line velocity; and
> 3. The collecting system shall discharge the rubber particles to an *approved* outdoor noncombustible or fire-resistant container, which is emptied at frequent intervals to prevent overflow.

Reason: The 2012 IFC has this exact requirement in Section 3403.2 for buffing areas in tire rebuilding operations. The requirement is to prevent the fire hazard of rubber dust generated by these operations. The requirement is different than the general requirement for "grinding rooms" in IBC Section 415.8.1.2. Because it is a requirement that affects building construction it should also appear in the building code so that designers can make informed decisions concerning this use.

Cost Impact: The code change proposal will not increase the cost of construction as it is already a requirement in the IFC.

G_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

415.8.1.7 (NEW)-G-GUPTON

G89 – 12
419.1

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

419.1 General. A *live/work unit* shall comply with Sections 419.1 through 419.9.

Exceptions:

1. Dwelling or sleeping units that include an office that is less than 10 percent of the area of the *dwelling unit* are permitted to be classified as *dwelling units* with accessory occupancies in accordance with Section 508.2.
2. Live/work units where the work area that is less than 10% of the dwelling unit in a one- and two- family dwelling or townhouse shall be permitted to be constructed in accordance with the International Residential Code and shall have an automatic sprinkler system in accordance with Section R313.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The proposed code change corrects the circular language that would require live/work units in one- and two- family dwellings and townhouses from having to be built in accordance with Section 419 of the International Building Code. This is a two part code change proposal which must first be corrected in the IBC, followed by a modification of the current exception in the IRC. The current language in both IRC and the IBC states the live/work units must be classified as a R-2 occupancy and shall comply with section 419 of the IBC. If an owner of a one- and two- family dwelling wanted to convert a small portion of their dwelling to a live work/unit, they would have to perform extensive modifications to the existing structure, to meet the requirements of an R-2. Speaking with the proponents of the original code change, it was not the intent to change the occupancy of a one- and two- family dwelling to an R-2.

The additional change to the code with this new exception is to limit the size of the work portion to no more than 10% of the dwelling unit. Based on the concerns of increased live loads to the load bearing capabilities and the potential increase in the fuel loads, it was determined by the BCAC that the size limitations is reasonable from both a functional use of space as well as a balance to not create any increased hazards for the use of the dwelling.

Cost Impact: The proposed language will lower the cost of construction by providing for clarity in the allowance of having a live/work unit in a detached one – and two-family dwelling built under the IRC.

G89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

419.1-G-BAJNAI-BCAC

G90 – 12

402.1, 402.2, 420.3, 420.6 (NEW)

Proponent: Jason Thompson, P.E., National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

Revise as follows:

420.1 General. Occupancies in Groups I-1, R-1, R-2 and R-3 shall comply with the provisions of Sections 420.1 through ~~420.5~~ 420.6 and other applicable provisions of this code.

420.2 Separation walls. Walls separating *dwelling units* in the same building, walls separating *sleeping units* in the same building and walls separating *dwelling* or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *fire partitions* in accordance with Section 708. For buildings more than two stories in height or that have dwelling or sleeping units located on a floor level that is more than 25 feet above the grade plane, see Section 420.6.

420.3 Horizontal separation. Floor assemblies separating *dwelling units* in the same buildings, floor assemblies separating *sleeping units* in the same building and floor assemblies separating *dwelling* or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *horizontal assemblies* in accordance with Section 711. For buildings more than two stories in height or that have dwelling or sleeping units located on a floor level that is more than 25 feet above the grade plane, see Section 420.6.

420.6 Special requirements for Group I-1, R-1 and R-2 occupancies. Buildings classified as a Group I-1, R-1 or R-2 occupancy that are more than two stories in height or that have dwelling or sleeping units located on a floor level that is more than 25 feet above the grade plane shall comply with all of the following requirements:

1. The separation walls specified in Section 420.2 shall be constructed of noncombustible materials to provide a fire resistance rating of not less than 2 hours and shall comply with the requirements for fire barriers in accordance with Section 707.
2. The floor assemblies specified in Section 420.3 shall be constructed of noncombustible materials to provide a fire resistance rating of not less than 2 hours and shall comply with the requirements for horizontal assemblies in accordance with Section 711.
3. Load bearing walls shall meet the requirements of Section 1604 without the use of sheathing.
4. The materials used for construction of walls shall be of a type that is not adversely affected by moisture.

Reason: Though the loss of life from fires affecting Group I-1, R-1 and R-2 occupancies is not high with the changing construction methods and the noticeable shift to light weight construction methods, and the continued national trend in reducing fire department staffing numbers, the proposed code language provides for two distinct safety provisions. The first is the increased compartmentalization of the building to reduce fire spread and damage using passive fire protection methods. The second safety provision is the ability of the structure to be constructed in such a way that it retains its structural integrity after being subject to a fire. The provisions of **Section 101.3 Intent**, state:

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

Currently many of these load bearing walls are constructed in such a way that the wall sheathing is a critical part of the structural integrity of the wall. The sheathing is used for localized member stability, global stability, and in many cases the lateral load resisting system for the entire building. During an adverse event, such as a fire this sheathing can be compromised by fire damage, mechanical damage, and water damage compromising the overall structural integrity of the building. Where the current standard test used for fire resistance is the ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, in practice this test does not account for the reduction in strength and stiffness that results from fire and water damage. It is not practical to think that every assembly would be tested at designed load levels and the resulting strength and stiffness data used in design, as a result the proposed provisions would provide for the structure to rely on the sheathing only as a fire resistive element and would allow the structure to maintain its design strength after the sheathing was compromised or removed for any reason.

The proposed story level and floor height is based on the ability for a fire department to make a rescue from the exterior of the structure using the equipment commonly found on an NFPA 1901 equipped motorized fire engine, this using the most common extension ladder size, being a 24 foot long extension ladder which can easily reach a second floor window. In addition, for structures three stories or greater in height, the level of vertical load and potential lateral load on these walls increases and as a result an additional level of safety is needed.

While we acknowledge the success in NFPA 13 & 13R sprinkler systems to manage and control fire, the provisions of this code change are designed the assist those systems in effectively doing their job and to provide structural stability and strength that is dictated under the provisions of Section 101.3.

Cost Impact: This code change proposal may increase the cost of construction

G90-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

420.1-G-THOMPSON

G91 – 12
420, 420.1, 420.6 (NEW)

Proponent: Daniel E. Nichols, P.E., New York State Division of Code Enforcement and Administration (dan.nichols@dos.state.ny.us)

Revise as follows:

SECTION 420
GROUPS I-1, R-1, R-2, R-3, R-4

420.1 General. Occupancies in Groups I-1, R-1, R-2 ~~and~~ R-3 and R-4 shall comply with the provisions of this section and other applicable provisions of this code.

420.6 Protection of Attics. Attic spaces that are not used for living purposes, storage, or fuel-fired equipment in Group I-1 and Group R-4 occupancies shall meet one of the following conditions:

1. Be protected by an automatic sprinkler system in accordance with Section 903.3;
2. Be constructed of non-combustible construction; or
3. Be constructed of fire-retardant-treated wood in accordance with Section 2303.2.

Reason: In March, 2009, a fire at the Riverview Independent Residential Alternative (IRA) home for persons with developmental disabilities claimed the lives of 4 residents and injured the remaining 5 residents and 2 staff. The building was 1-story in height, approximately 3,000 square feet, of Type 5b construction and was built to the 2003 edition of the International Building Code (with additional requirements by the State of New York) just 1 year prior. The building was protected by a fully operational NFPA 13D fire sprinkler system (that was connected to a municipal water supply), automatic fire detection system throughout the habitable areas, a heat detection system within the attic space, and several non-required fire- and/or smoke-separations.

It has been determined that the fire origin was exterior to the building and the fire had a significant lead time prior to occupant notification. Whereas the non-required heat detection was placed every 1000 square feet within the attic space, the near zero temperatures and the arrangement of the attic space delayed the prompt activation of the detectors. At the time of fire alarm activation, smoke was already present within the sleeping area corridors and inhibited staff movement of residents. Prior to evacuation of all residents (which initially moved them near the main exit door, fire from the roof structure above the main door and he interior smoke conditions prevented further staff evacuation of the residents to the exterior.

The purpose of this code change proposal is to address a known hazard in occupancies that house residents with special needs but are permitted to have unsprinklered attic spaces. Addressing the goal of minimizing fire spread in attic spaces is presented in this code change by provided options that meet this goal; either by providing extinguishment or by limiting the fuel load. The location of 310.6.1 (new) for Group R-4 occupancies is so it applies to all Group R-4 occupancies but is scoped to keep the “5 and under” allowances consistent throughout the Group I Section. Section 308.3.3 (new) is proposed to address larger group homes as well as the other types of characteristic occupancies listed within 308.3 under Group I-1 since all occupancies have occupants that are expected to do a full evacuation during an emergency but may have issues getting to the exit.

Cost Impact: This will increase the cost of construction. However, the increase will be variable since three options are being proposed.

G91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

310.6.1 (NEW)-G-NICHOLS

G92 – 12
422.3

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Healthcare

Revise as follows:

422.3 Smoke compartments. Where the aggregate area of one or more *ambulatory care facilities* is greater than 10,000 square feet (929 m^2) on one *story*, the *story* shall be provided with a *smoke barrier* to subdivide the *story* into no fewer than two *smoke compartments*. The area of any one such *smoke compartment* shall be not greater than ~~22,500~~ <u>40,000</u> square feet (~~2092 m^2~~ <u>3719 m^2</u>). The travel distance from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60 960 mm). The *smoke barrier* shall be installed in accordance with Section 709 with the exception that *smoke barriers* shall be continuous from outside wall to an outside wall, a floor to a floor, or from a *smoke barrier* to a *smoke barrier* or a combination thereof.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the <u>American Society for Healthcare Engineering</u>, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

Intent and Summary

This code change addresses outdated code material. Historically, smoke compartment size has been driven by the allowable travel distance within the smoke compartment. Past code changes have increased the travel distance without a corresponding change in smoke compartment size. Secondly, the size of the functional patient areas has increased, but the occupant load has remained the same or has been reduced. Therefore, we are asking for an increase in smoke compartment size to accomodate the operational needs of these facilities.

A summary of the history of smoke compartment requirements is as follows:

- October 1984 BCMC – No area limitations. Maximum length and width equals 150 feet.
- 1987 BOCA – 610.5 – No area limitations. Maximum length and width equals 150 feet
- 1992 BOCA Supplement – 610.4 – 22,500 square feet, with maximum travel distance of 150 feet.
- Code Change No. B20-95 – 22,500 square feet, with maximum travel distance proposed to be increased to 200 feet.
- 1996 BOCA – 409.4 - 22,500 square feet, with maximum travel distance of 200 feet.
- 2000 IBC – 407.4 - 22,500 square feet, with maximum travel distance of 200 feet.

Originally, there was no limit to smoke compartment size, other what was imposed by travel distance. The 22,500 square foot requirement was based on the old travel distance requirement of 150 feet, and used it to extrapolate an area (150ft x150ft = 22,500 square feet). This proposal uses the same logic and applies the current 200 foot travel distance maximum (200ft x200ft), resulting in a 40,000 square foot smoke compartment. This proposal would maintain the existing requirement that each floor be divided into two smoke compartments. Practically the requirement for 200' travel distance within smoke compartments will still drive smaller smoke compartment sizes in some cases.

The application of the smoke compartment size for Ambulatory Care facilities was taken from the hospital requirement in Section 407. There was no specific reason given for using 22,500 square feet as a threshold other than mirroring the hospital requirement.

When studying the contemporary sizes of functions within ambulatory surgery areas, the area provided has increased. Attached is a study of space programs which compare the 2010 Guideline requirements with the 1996-97 Guidelines. In short, today's ambulatory surgery facility takes more square footage to care for the same amount of patients. These programs demonstrate the need to increase to 40,000 square foot smoke compartment. See program analysis at the following link.
http://www.iccsafe.org/cs/AHC/Pages/WG-General.aspx

Cost impact: This proposal will help to decrease the cost of construction. Increasing the compartment size will reduce the number of smoke and fire dampers and lifetime maintenance costs could proportionally decrease.

G92-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

422.3-G-WILLIAMS-ADHOC.doc

G93 – 12
422.8 (NEW)

Proponent: Joe Nebbia and Mark Nowak, Steel Framing Allinace

Add new text as follows:

422.8 Allowable Building Heights and Areas. For Type V Construction, *ambulatory care facilities* shall be limited to the height and area allowances for Group I-2 buildings found in Table 503.

Reason: Ambulatory care facilities often house multiple care recipients that are partially or fully incapacitated during their treatment, making egress during a fire especially difficult if not impossible. Designers typically recognize the issues with evacuation and apply a defend-in-place approach.

A new section (Section 422 in the 2012 edition) was added to the code in 2009 and subsequently modified in 2012 adding specific requirements for separation, smoke compartments, refuge areas, independent egress, sprinklers, and alarms for ambulatory care facilities. A corresponding change to the code reclassified ambulatory care facility as Group B. Supposedly, the use group re-classification was a trade-off in exchange for the additional requirements in Section 422. However, these modifications to the code failed to recognize important aspects of the defend-in-place approach and leave some of the most venerable members of society at higher risk during fires.

This change would ensure that for Type V construction, which has the least restrictions on combustible materials of any construction type, full fire protection equivalent to or better than the pre-2009 code is made available to care recipients in vulnerable situations.

This proposal still allows all other types of construction that do not rely on the use of combustible framing materials to take advantage of the less restrictive Group B height limits in accordance with the changes approved in the 2009 edition of the code.

Defend-in-place is a concept that relies on multiple methods to allow a fire to be identified and eliminated while occupants are in a safe place. It is employed in a variety of buildings including but not limited to hotels, apartments, hospitals, and prisons. The 2008 NFPA Fire Protection Handbook (Chapter 20-Section 15) addresses healthcare occupancies. This section of the Handbook focuses on "those facilities that pose the greatest risk due to the impairment of occupants and/or lack of ambulatory capabilities of the occupants." It includes ambulatory healthcare facilities as buildings that fall into this category, and stresses the defend-in-place principles.

In reference to ambulatory and other healthcare occupancies, the Handbook states that "Buildings of two or more stories should be constructed of noncombustible materials…" It further emphasizes that "Vertical evacuation of occupants within a healthcare facility is, at best, difficult and time consuming."

In summarizing the important points of the defend-in-place concept for healthcare facilities (including ambulatory care facilities), the Handbook identifies fire-resistive construction as one of the important components of the approach. Unfortunately, the changes in the 2009 and 2012 code failed to retain this important part of the principle.

The importance of protecting the occupants in an ambulatory care facility is reinforced by the fact that prior to 2009 ambulatory care facilities would have been classified as Group I-2 construction. Section 504.2 of the code does not allow I-2 buildings to take the allowable height increase for sprinklers. This makes it difficult to rationalize the height increases that come with reclassification to group B. Changing the group classification and distinguishing ambulatory care facilities from other health care facilities where the occupants are incapable of caring for themselves through a definition that limits the duration of the stay does not change the risk to the occupants. Permitting the use of combustible materials to in taller buildings further increases the risk.

Cost Impact: The code change proposal will increase the cost of construction. The proposal will indirectly increase costs for a small number of buildings that will be limited in height under Type V construction.

G93-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

422.8 (NEW)-G-NEBBIA-NOWAK

G94 – 12
423.3 (NEW)

Proponent: Andrew Herseth FEMA and Erin Ashley URS Corporation, representing Dept. Homeland Security, Federal Emergency Management Agency

Revise as follows:

SECTION 423
STORM SHELTERS

423.1 General. In addition to other applicable requirements in this code <u>and this section,</u> storm shelters shall be constructed in accordance with ICC-500.

423.1.1 Scope. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

423.2 Definitions. The following terms are defined in Chapter 2:

STORM SHELTER.
Community storm shelter.
Residential storm shelter.

<u>**423.3 Group E Occupancies.** In areas where the shelter design wind speed for tornadoes is 250 MPH per Figure 304.2(1) of ICC 500, all Group E Occupancies with an aggregate occupant load of 50 or more shall have a storm shelter constructed in accordance with ICC 500. The shelter shall be capable of housing the total occupant load of the Group E occupancy.</u>

<u>**Exceptions:**</u>

1. <u>Group E day care facilities.</u>
2. <u>Group E occupancies accessory to places of religious worship.</u>
3. <u>Buildings meeting the requirements for shelter design in ICC 500.</u>

Reason: Due to unpredictable and often very short tornado warning time, there are many events where it is unfeasible to evacuate schools. Field studies of the Spring 2001 Southern US tornadoes revealed extensive damage to schools (including safe refuge areas) built to current codes. A saferoom provides near absolute protection for this vulnerable population. Background of this proposal is given below.

On May 6, 2011, the Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) deployed a Mitigation Assessment Team (MAT) to the States of Alabama, Georgia, Mississippi, and Tennessee to assess the damage caused by an outbreak of tornadoes occurring April 25 through April 28, 2011. A second MAT was deployed on June 1, 2011 to Missouri following the tornado on May 22 in Joplin. The results of their study presents MAT observations, conclusions, and recommendations in response to those field investigations highlight the importance of properly selecting the best available refuge area in existing facilities, incorporating shelters and safe rooms in new construction as well as the importance of eliminating collapse hazards, such as tree fall and other nearby objects.

The MAT observed 20 schools, 6 of which are described in Chapter 6 of the MAT Report to be published in Spring 2012. Each of these 6 schools saw high levels of damage due to the increase wind loading sustained by the building. The schools discussed are located in Missouri, Alabama, and Georgia.

IBC-compliant facilities are susceptible to significant building damage and disruption if struck by strong or violent tornadoes, as evidenced by the damage sustained by Joplin East Middle School during the May 22, 2011 Joplin tornado. While Joplin East Middle School was not occupied during the tornado (the tornado occurred on Sunday evening), the outcome could have been disastrous the school had been occupied. There were no safe rooms (by the definition of ICC 500-2008) located within the school, only "designated refuge areas." The auditorium roof and two exterior walls collapsed (see Figure 1), along with two roof trusses and an exterior wall of the gymnasium. The remainder of the damage was from wind-borne debris, including glazing damage, as well as water damage due to damaged roof covering, decking, and rooftop equipment. The tornado was estimated as an EF 3 by the National Weather Service and an EF 2 by the FEMA Mitigation Assessment Team (MAT).

Figure 1 (Figure 6-44 of the MAT Report): View of the collapse of the auditorium roof and both exterior walls of Joplin East Middle School.

Several other schools evaluated for damage by FEMA MAT deployed following the Spring 2011 tornado outbreak all showed substantial damage when exposed to a tornado. The consequences of the inability of a school to withstand a tornado event coupled with the lack of an ICC 500-compliant safe room could lead to devastating consequences, including loss of life.

Joplin High School, like the Middle School, was also unoccupied during the tornado event. The High School did not have a tornado safe room or shelter. Several lower level corridors were designated refuge areas. Debris was blown into these corridors during the tornado (see Figure 2).

Figure 2 (Figure 6-52 of the MAT Report): View of a corridor designated as a tornado refuge area in Joplin High School. The debris was blown into the corridor during the tornado.

The rest of the school saw widespread damage, including collapse of the gymnasium (see Figure 3), extensive exterior wall damage to the North classroom wing (see Figure 4) along with roof system damage, destroyed roof covering, broken glazing, collapse of the east wall of the classroom wing along the courtyard, and the collapse of portions of the auditorium walls. The NWS rated the tornado an EF4, while the FEMA MAT assessed the damage and determined the tornado was an EF3.

Figure 3 (Figure 6-56): View of the collapsed primary gymnasium of Joplin High School. The gymnasium collapsed through progressive failure.

Figure 4 (Figure 6-53 of the MAT Report): North classroom wing damage of Joplin High School.

Alberta Elementary School and University Place Elementary School in Tuscaloosa, Alabama, as well as both Ringgold Middle School and Ringgold High School in Ringgold, Georgia all also experienced damage from the Spring 2011 tornado outbreaks. None of these schools had safe rooms built to ICC 500-2008 specifications. Alberta Elementary school, where luckily the students had been sent home from school before the tornado struck, saw destruction of one of its "designated refuge areas." University Place Elementary School, Ringgold Middle School, and Ringgold High School were also not occupied during the tornado events because of early dismissals issued because of weather forecasts. It is lucky none the schools were occupied, as they all saw extensive damage.

Not all schools investigated by the FEMA MAT were lacking ICC 500-compliant safe rooms however. Seneca Intermediate School in Seneca, Missouri built a FEMA P-361, *Design and Construction Guidance for Community Safe Rooms* (FEMA, 2008), compliant safe room following damage from a tornado in May 2008. Though the community of Seneca, Missouri, was not hit by a tornado May 22, 2011, the MAT inspected this new community safe room as a case study for good safe room construction.

Seneca, Missouri, is not the only community that decided to take action and install an ICC 500-compliant safe room in its newly constructed school. On April 30, 2010, Alabama Governor Riley signed Act No. 2010-746 enacting a requirement for any new contract awarded on or after July 1, 2010 for the construction of a new public school (grades kindergarten to twelfth) to include a Building Commission of Alabama approved safe space or hallway. Pursuant to this Act, the Building Commission of Alabama adopted the ICC 500-2008 as the minimum building code for safe spaces. Safe spaces are required to comply with the building code requirements for tornado shelters. Compliance with the building code requirements for hurricane shelters is recommended, but not mandatory. Any renovations, additions to existing schools, or auxiliary buildings added to an existing school are not considered "a new public school" and are exempt from including an approved safe space or hallway.

A requirement, such as that enacted by Act No. 2010-746 in Alabama and the proposed code change (proposed Section 423) are important for life-safety as there may not always be enough of a lead time before a tornado strikes for early dismissal from schools and for students to seek safety. As was the case with University Place Elementary School, warning time for tornadoes can make all of the difference. FEMA technical and policy guidance on safe rooms recommends only having a 5 minute travel time (0.5-

mile distance) to seek shelter from a tornado. It is oftentimes imperative therefore, that students are able to shelter at their schools. In order for the students to be given near-absolute protection from a tornado, the safe rooms in schools need to be constructed to meet ICC 500-2008 standards, as is proposed by the addition of Section 423.

Cost Impact: This proposal will increase the cost of construction.

From FEMA 361, *Design and Construction Guidance for Community Safe Rooms (Second Edition),* FEMA reviewed 36 safe room grant applications from 2008. On average, the safe room cost per square foot for projects considered technically feasible
And effective for providing protection was $188/sf. From more expanded grant application data from years 2005 to 2008, the percent increase in building cost to harden a portion of a new building to resist debris impact from a 15-lb 2x4 board missile traveling horizontally at 100 mph and impacting vertical surfaces and the same missile traveling vertically at 67 mph and impacting horizontal surfaces is 5-27%. More information on Safe Room design costs can be found in chapter 2 of FEMA 361.

G94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

423 (NEW)-ASHLEY-HERSETH #1

G95 – 12
423.3 (NEW)

Proponent: Andrew Herseth FEMA and Erin Ashley URS Corporation, representing Dept. Homeland Security, Federal Emergency Management Agency

Revise as follows:

SECTION 423
STORM SHELTERS

423.1 General. In addition to other applicable requirements in this code <u>and this section,</u> storm shelters shall be constructed in accordance with ICC-500.

423.1.1 Scope. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

423.2 Definitions. The following terms are defined in Chapter 2:

STORM SHELTER.
Community storm shelter.
Residential storm shelter.

<u>**423.3 Critical Emergency operations.** In areas where the shelter design wind speed for tornadoes per Figure 304.2(1) of ICC 500 is 250 MPH, 911 call stations, emergency operation centers and fire, rescue, ambulance and police stations shall have a storm shelter constructed in accordance with ICC 500.</u>

<u>**Exception:** Buildings meeting the requirements for shelter design in ICC 500.</u>

Reason: Critical facilities, such as emergency operations centers (EOCs), fire and police stations and other buildings are essential for the delivery of vital services or protection of a community. Tornado damage investigations and other research have shown us techniques for protecting occupants of critical facilities struck by tornadoes, as well as maintaining continuity of operations for those facilities. Emergency operation centers and Police and fire rescue facilities are critical to disaster response because an interruption in their operation as a result of building or equipment failure may prevent rescue operations, evacuation, assistance delivery, or general maintenance of law and order, which can have serious consequences for the community after a storm event.

On May 6, 2011, the Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) deployed a Mitigation Assessment Team (MAT) to the States of Alabama, Georgia, Mississippi, and Tennessee to assess the damage caused by an outbreak of tornadoes occurring April 25 through April 28, 2011. A second MAT was deployed on June 1, 2011 to Missouri following the tornado on May 22 in Joplin. The results of their study presents MAT observations, conclusions, and recommendations in response to those field investigations highlight the importance of properly selecting the best available refuge area in existing facilities, incorporating shelters and safe rooms in new construction as well as the importance of eliminating collapse hazards, such as tree fall and other nearby objects.

The MAT observed 16 EOCs, as presented in Chapter 7 of the MAT report to be published in Spring 2012, fire stations and police stations that were located where the basic (design) wind speeds prescribed in IBC 2009 is 90 mph (ICC 2009) throughout Alabama, Mississippi and Missouri. Each of these 16 facilities saw some level of damage due to the increase wind loading sustained by the building.

Two such examples from the MAT highlighting the need for shelters in critical facilities are the Tuscaloosa Fire Station 4 and the Smithville Police Station.

The Tuscaloosa Fire Station 4 (Tuscaloosa, AL) is a building which was in the vicinity of the tornado track, rated an EF4 by NWS, as shown in Figure 1. Four fire station personnel were in the building when the tornado struck although none were injured.

Figure 1 (Figure 7-38 of the MAT Report): Aerial view of the track in the vicinity of the fire station (yellow circle). The center of the track is approximated by the red line (Tuscaloosa, AL) (Source: Modified from NOAA, 2011)

This fire station was opened in 1952. The fire station had a modified bitumen roof membrane system over a cast-in-place concrete deck. Some of the exterior walls were brick (which appeared to be bearing walls). Other exterior walls were stucco over wire lath over furring over what appeared to be cast-in-place concrete. The apparatus bay had two sectional doors at the front and back of the bay. There was not a safe room or shelter in the building. The tornado blew all four apparatus bay doors away, all of the exterior windows were broken, the roof membrane was punctured in a few areas, some of the cap sheet was blown away, and some rooftop equipment was blown away. Figure 2 is a general view of the fire station and the adjacent apartment building.

Figure 2 (Figure 7-39 of the MAT Report): The fire station is within the red circle. The apparatus bay is indicated by the blue arrow and the living quarters are indicated by the green arrow. The yellow and orange arrows indicate the nearby heavily damaged apartment buildings (Tuscaloosa, AL)

The Smithville Police Department (Smithville, MS) experienced substantial damage and casualties after the tornado. NWS rated the core of the track in the vicinity of the police department as an EF5 as shown in Figure 3 below. At the time the tornado struck there were seven people in the building, five of whom were injured by the tornado damage.

Figure 3 (Figure 7-48 of the MAT Report): Aerial view of the tornado track in the vicinity of the Smithville Police Department (yellow circle). The center of the track is approximated by the red line (Smithville, MS) (Source: Modified from NOAA, 2011)

The Smithville Police Department was constructed in 1962. The building was constructed of unreinforced CMU with brick veneer. The facility did not have a shelter or safe room. During the storm, the roof of the police department was blown off, and large portions of the walls on the north, east, and south sides of the building collapsed.

Figure 4 (Figure 7-52 of the MAT Report): The red arrow indicates the office where two children and an adult got under the desk to take refuge (Smithville, MS)

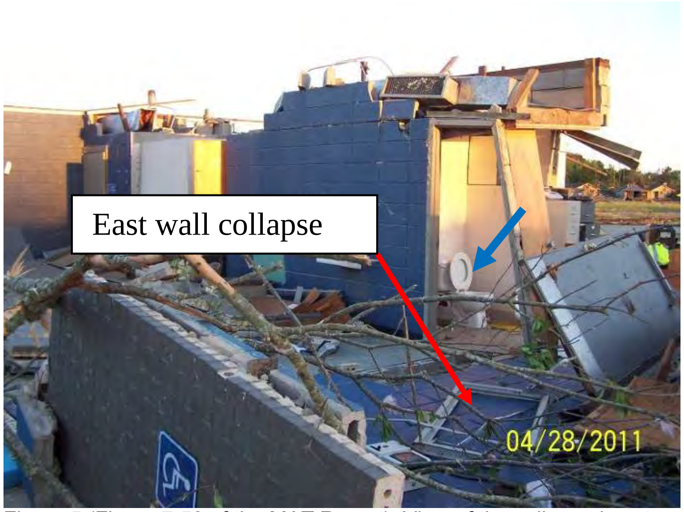

Figure 5 (Figure 7-53 of the MAT Report): View of the collapsed east wall (red arrow) and restroom (blue arrow) of the Smithville Police Department. Note that some of the restroom walls collapsed (Smithville, MS)

At the time the tornado struck there were seven people were in the building including police personnel and civilians. Two people sustained injuries. As a result of the tornado, the Smithville Police Department lost complete functionality at its original location and has been relocated to the town hall.

Another facility investigated by the MAT was the Cullman County Emergency Management Agency; this facility was not struck by the Cullman tornado on April 27, 2011. In 2008, the Cullman County Emergency Management Agency (EMA) moved into its new facility in the basement of the newly constructed Cullman County Water Department Building. The EMA portion of the facility was designed as a safe room in accordance with FEMA 361 (2000 edition) to resist the wind and wind-borne debris associated with EF5 tornadoes: wind speeds of 250 mph (3-second gust) and debris impact from a 15-lb 2x4 board missile traveling horizontally at 100 mph.

According to the architect, the portions of the facility designed to the FEMA 361 criteria were constructed for approximately $200 per square foot for a total cost of roughly $1,250,000. By contrast the upper floor of the facility (used for other Cullman County offices) was constructed at a cost of approximately $120 per square foot. If constructed to the building code in effect at the time, the EMA portion of the facility would have cost approximately 50% less. Implementing the FEMA 361 criteria for the selected portions of the facility ended up accounting for approximately 65% of the total building cost. By choosing to spend an additional 25% on the facility, the owner and architect were able to achieve both personal protection for the 25 county staff and also provide continuity of operations during events. Additionally, based on FEMA 361 criteria regarding the number of occupants, the multipurpose room can provide protection for the facility staff as well as up to 300 additional persons (if needed).

The code should consider including a shelter to protect occupants of critical facilities, making enhancements to building design that will minimize building damage, and designing the facility to avoid interrupted operations even if struck by violent tornadoes.

Cost Impact: This proposal will increase the cost of construction.

From FEMA 361, *Design and Construction Guidance for Community Safe Rooms (Second Edition),* FEMA reviewed 36 safe room grant applications from 2008. On average, the safe room cost per square foot for projects considered technically feasible and effective for providing protection was $188/sf. From more expanded grant application data from years 2005 to 2008, the percent increase in building cost to harden a portion of a new building to resist debris impact from a 15-lb 2x4 board missile traveling horizontally at 100 mph and impacting vertical surfaces and the same missile traveling vertically at 67 mph and impacting horizontal surfaces is 5-27%. More information on Safe Room design costs can be found in chapter 2 of FEMA 361.

G95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

423 (NEW)-HERSETH-ASHLEY #2

G96 – 12
423.1, 423.3 (NEW), 423.3.1 (NEW), 423.3.2 (NEW), 423.4 (NEW)

Proponent: Stephen V. Skalko, P.E., Portland Cement Association, Eric T. Stafford, P.E., representing Institute for Business and Home Safety, Jason Thompson, P.E., National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

423.1 General. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC-500 shall be provided in accordance with Section 423.3.

423.1.1 Scope. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

423.3 Storm shelters required. Storm shelters shall be provided for occupants of buildings in accordance with Sections 423.3.1 and 423.3.2.

Exceptions:

1. *Buildings* meeting the requirements for shelter design in ICC/NSSA 500.
2. Where storm shelters within 1/4-mile of the proposed *building* are available and have adequate size to accommodate the added occupant load of the proposed *building*.
3. Where the code official determines the *building* size, location or occupant load does not warrant shelters.

423.3.1 Hurricane areas. In hurricane-prone regions as defined in Section 1609.2 of the *International Building Code,* the following buildings shall be provided with storm shelters:

1. Group A-3 community halls, gymnasiums and libraries.
2. Group B civic administration facilities.
3. Group E, I-1, I-2, I-3, M or R occupancies.
4. Buildings assigned to Risk Category I in accordance with Section 1604.5 of the *International Building Code.*

423.3.2 Tornado areas. In areas where the shelter design wind speed for tornadoes of Figure 304.2.(1) of ICC/NSSA 500 is 160 mph or greater, tornado shelters shall be provided, except that such shelters shall not be required for buildings classified as Group U occupancies or classified as Rick Category I according to Table 1604.5.

423.4 Combined hurricane and tornado shelters. Where combined hurricane and tornado shelters are provided the shelter shall comply with the more stringent requirements of ICC/NSSA-500 for both types of shelters.

Reason: Jurisdictions in high-wind event prone areas are in need of criteria to establish where the presence of storm shelters is required. This continues to be a request from jurisdictions following disastrous high wind events. Following the 2010 disasters in mid-America, specifically during a FEMA sponsored workshop in Alabama, jurisdictions sought information and guidance for integrating storm shelters into their building code requirements. Routinely, and specifically at this workshop, jurisdictions have been directed to the ICC 500, FEMA documents, and design tools provided by the industry sectors supporting the proper design and construction of storm shelters. Increasingly, after every such event, it becomes apparent that the tools for the design and construction of storm shelters are readily available, but what jurisdictions lack is the guidance as to where storm shelters should be required.

In Section 423 of the International Building Code there are provisions referencing the use of ICC 500-2008 ICC/NSSA *Standard for the Design and Construction of Storm Shelters* for design and construction of storm shelters. However, the IBC does not specify which buildings should be provided with storm shelters. This proposal is to places requirements in the IBC specifying when storm shelters are appropriate.

The first exception communicates that entire buildings can be designed to satisfy the requirements of ICC/NSSA 500. Such buildings not only provide improved life safety but will minimize the amount of energy and resources required for repair, replacement removal and disposal of building materials and contents. It also increases the likelihood these buildings will be available post-disaster to provide for community needs during recovery. The second exception permits the use of a nearby shelter to be used that can be reached in a reasonable amount of time from the building being constructed.

Incorporating storm shelters and community shelters into the design of buildings located in high wind regions enhances the living environment for the occupants. These shelters become havens for protecting people from injury or death due to structural collapse and windborne debris. Additional benefits are enhanced life safety, security and occupant comfort; potentially less demand on community resources required for emergency response and healthcare; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future. The photos below reflect the importance of providing storm shelters in high wind areas.


Tornado damage – FEMA

Hurricane Shelter - FEMA


Tornado Shelter - FEMA

Cost Impact: This proposal will increase the cost of construction

G96-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

423-G-SKALKO-STAFFORD-THOMPSON

G97 – 12
425 (NEW)

Proponent: Larry Stump (lstump@willdan.com), Willdan Engineering, representing Arizona Building Officials Code Review & Development Committee

Add new text as follows:

SECTION 425
DECONTAMINATION ROOMS

425.1 General. Decontamination Rooms shall comply with the provisions of this section and other applicable provisions of this code.

425.2 Definitions. The following terms are defined in Chapter 2:
DECONTAMINATION ROOM
COLD ZONE
HOT ZONE
TRIAGE AREA
WARM ZONE

425.3 Location. A decontamination room shall be provided with an outside entry located as far as practical, but not less than 20 feet from the closest hospital entrance. The decontamination rooms shall be provided with an ambulance staging area.

425.4 Design and construction. All zones within the decontamination room shall be separated by manually activated power sliding glass doors. No two doors shall operate at the same time. Each zone in the decontamination room shall be negative in pressure to the next zone in the progression of route prior to activation of the door between the two zones. The decontamination room shall be served by a dedicated HVAC system specifically designed to support this function and shall not serve other areas of the hospital. Multiple showers with privacy curtains shall be provided for ambulatory and non-ambulatory patient assistance. The room design shall provide for full decontamination of a person within 15 minutes. The cold zone shall connect to the emergence room by means of a connecting corridor. The connecting corridor shall have a minimum width of ninety-six inches and doors shall accommodate the largest non-ambulatory piece of equipment.

425.5 Surfaces. Surfaces shall be smooth, nonporous, and scrubbable. Floors, walls and monolithic ceiling surfaces shall be seamless and be coated with an inert material that enables all surface areas to be washed with soap, water and rinsed by a hose wand. All fixtures, trims and handrails shall be water proof, and acid and rust resistant.

425.6 Electrical. Electrical design, fixtures, switches, receptacles and any other electrical appurtenance associated with a decontamination room shall comply with this section.

425.6.1 Lighting. Explosion-proof lighting fixtures that conform to NFPA 70 Class 1, Division 2, Group D shall be installed. Lighting fixtures shall be UL-listed, explosion-proof pendent type. All luminaries installed in wet locations shall be marked SUITABLE FOR WET LOCATIONS

425.6.2 Switches. Control switches for lighting and equipment in the hot zone shall be located in the warm zone. All switches in the decontamination room shall be equipped with water proof covers, and shall be intrinsically safe per NEC Section 500.7(E).

425.6.3 Receptacles. The decontamination room is considered a wet location and NEC requirements for wet locations are applicable. All receptacles shall meet the requirements of NEC Section 500.7(E).

425.6.4 Standby power. Mechanical ventilation equipment, lighting, receptacles, water heaters, doors and other equipment required for the operation of the decontamination room shall be connected to a standby power system in accordance with Section 909.11.

425.7 Mechanical. Mechanical design, ducts and equipment serving a decontamination room shall comply with this section.

425.7.1 Ventilation. The decontamination room shall be supplied by an external air conditioning system. The mechanical ventilation equipment shall provide not less than 30 air exchanges per hour during periods of decontamination. When the doors are open, the supply-air volume shall maintain not less than 30 psi positive pressure from the entrance of the new zone. Manometers shall be installed adjacent to doors between zones to indicate room pressure on each side of the door. Makeup air and exhaust shall communicate directly to the outdoors and serve no other areas of the building.

> **Exception:** During occupied periods other than decontamination, outdoor air ventilation quantities may be in accordance with IMC Table 403.3 and recirculation is permitted where a rapid change from recirculation to fresh air flow is provided.

425.7.2 Exhaust and Supply Air Units. Both exhaust and supply air units shall be located on the roof and be equipped with special filtering capable of capturing airborne contaminants particles down to 0.3 pm (micrometers) in size. Exhaust termination outlets shall be a minimum of 20 feet from openings or air intakes to buildings.

425.7.3 Air Ducts. Air ducts serving a decontamination room shall not be located within the room and shall not pass through a rated wall or ceiling. Ducts shall pass a leakage pressure test prior to being concealed. Ducts shall be round noncorrosive material within the first 12 feet of the room. Horizontal duct within the first 12 feet shall be sloped a minimum of 1 percent toward the decontamination room register connection.

425.7.4 Grilles and Registers. Grilles and registers installed in a decontamination room shall be made of extruded aluminum material. They shall be surface mounted and have a hinged face for inspection and cleaning. The supply and exhaust air terminals shall be located in walls with the supply located 12 inches below the ceiling and the exhaust located 12 inches above the floor.

425.7.5 Air Balance. The ventilation air distribution system shall be provided with means to adjust the system to achieve the minimum ventilation airflow rate and the pressure differential between zones as required by Sections 425.4 and 425.7.1. A certified third party air balance test is required to verify that the ventilation system is capable of supplying and exhausting the airflow rates required. Air balance shall be completed using an approved method and test certification provided prior to final inspection.

425.8 Plumbing. Plumbing design, piping, fixtures and equipment serving a decontamination room shall comply with this section.

425.8.1 Water Piping. Water piping shall not be exposed in the decontamination room and shall be approved non-corrosive material listed for use within a building. Potable water shall be provided to the room and an approved backflow preventer installed at the supply connection outside of the room.

425.8.2 Shower. The hot zone shall be provided with a minimum of 8 showers, 4 female and 4 male. One male and one female shower shall be large enough to serve a non-ambulatory patient on a gurney. Showers heads shall be the hand held type and the control valve shall be supplied with only one water source with a preset water temperature of 104º F. Each shower shall have its floor sloped 1 percent to an approved 2 inch drain to prevent flow of water to adjacent bathers.

425.8.3 Room Floor Drains. Decontamination rooms shall be provided with 4 inch floor drains connected to the waste system. Floor drains shall be designed to provide rapid wash down of all surfaces within the room. Floors shall be sloped a minimum of 1 percent to floor drains. Floor and shower drains shall be equipped with automatic trap primers.

425.8.4 Water Wand. Water wands or hose reels shall be located within the decontamination room to provide wash down of all room surfaces.

425.8.5 Waste and Vents. Vents serving decontamination room plumbing traps shall extend through the roof separately or be connected to other vents serving the decontamination room. Vent shall terminate not less than 20 feet from openings or air intakes to buildings. Waste piping serving a decontamination room shall not connect to other waste systems but shall connect directly to the building sewer.

Exception:

1. Where it is not practicable to connect the waste piping directly to the building sewer, connection to an existing building drain pipe is permitted. The connection to an existing horizontal waste pipe shall be located not less than 10 feet from other waste connections.
2. Where no gravity waste piping exists, a properly sized sump is permitted. The sump shall be provided with dual ejector pumps arranged to function alternately during normal use and independently in case of overload or mechanical failure. The pumps shall have an audio and visual alarm, readily accessible, that signals pump failure or an overload condition. The discharge piping from the pumps shall terminate at a direct connection to the sewer. Piping material shall be pressure rated and be double contained with leak detection. All piping shall be pressure tested before final inspection. Pumps shall be connected to the standby power as noted in Section 425.6.4.

425.9 Overflow Facilities. A hospital shall be permitted have a portable decontamination unit or tent to process patients during catastrophic disasters. An exterior tempered water connection, sanitary sewer connection and a standby power connection shall be provided to serve the unit near the ambulance staging area.

Add new definitions to Chapter 2 as follows:

DECONTAMINATION ROOM. A separate area of a hospital divided into not less than three isolated zones (hot, warm and cold) for the purpose of rendering contaminated patients, first responders and hospital staff non-contaminated.

COLD ZONE. An area protected from contaminates and contaminated patients used as the final testing and staging area for patients and hospital staff entering the hospital.

HOT ZONE. An area where individuals are evaluated for possible contamination and where decontamination is performed. This zone is the staging area prior to passing into the "warm zone".

TRIAGE AREA. An admitting room that is entered from outside the hospital and also precedes the decontamination room with no access to other areas of the hospital.

WARM ZONE. A transition area from the hot to cold zone where people are retested for contaminants and determined to be "safe" for transition into the cold zone or "contaminated" and sent back to the hot zone for further decontamination.

Reason: Create a new code section for the minimum design requirements of a decontamination room for the protection of healthcare workers as well as patients and visitors to a hospital. A risk of exposure to chemical, biological, or radiological material exists when a hospital receives contaminated patients, particularly during a mass casualty incident. During "mass casualty hazardous materials incidents", patients that are exposed/contaminated to hazardous materials agent will likely bypass fire department decontamination efforts and self-refer to a hospital emergency room(ER). Hospitals now realize they need a dedicated room for decontamination because a portable decontamination tent may not be adequate.

During a recent code plan review of a hospital decontamination room, I noticed the designer left out basic items that would jeopardize the continued operation and effectiveness of the decontamination room. I would make recommendations to him base on my 23 years of experience in hospital inspections but without an IBC code section to back me up, I had no other option but to approve his plan. Hospitals are adding decontamination rooms because they realize the threat of having their ER exposed. A search of JACHO, OSHA, AIA and Facilities Guidelines institute, Guideline for Healthcare Facilities resulted in no design standards for decontamination rooms.

The Joint Commission (TJC) and OSHA/Dept. of Commerce regulations require hospital Emergency Departments to prepare for hazardous materials incidents including patient decontamination. American Institute of Architects (AIA) guidelines 7.9.D.25 indicates that a decontamination area shall be provided but as of the submittal date of this new code section, minimum designs for decontamination rooms have not transpired.

Bibliography: D.C. medical center unveils mass casualty design template – Steven K. Wagner March 2008 of HFM magazine; Management of hazmat incidents in hospitals – Dr. Jimmy Chan Business Briefing; Hospital Engineering & Facilities Management 2005; An engineer's mathematical approach to designing an emergency room decontamination area for weapons of mass destruction casualties – Eldo E. Frezza, Erica Fletcher, Veronica Flores, Ellen Popolo, Fay Tal Placido 2007 Journal of Social Sciences; Recommendations for hospital based hazardous materials decontamination capabilities in the northwest Ohio region – by Gregory Locher for Northwest Ohio Regional Health Care Disaster Preparedness; Decon design by Craig Kampmier; Human decontamination – Wikipedia; Millard Fillmore Suburban Hospital new decontamination room; 5.1.3.7(5) Decontamination Area – Washington State amendments for hospital licensing regulations.

Cost Impact: The code change proposal will increase the cost of construction for existing small hospitals but the cost increase will be insignificant for new construction of a hospital.

G97-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

425 (NEW)-G-STUMP

G98 – 12
425 (NEW), 1507.16, 1507.16.1

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Add new text as follows:

SECTION 425
ROOFTOP GARDENS AND LANDSCAPED ROOFS

425.1 General. Rooftop gardens and landscaped roofs shall comply with this section.

425.2 Roof construction. Areas of roofs intended for rooftop gardens or landscaped roofs shall be designed for the appropriate loads in accordance with Chapter 16, The roof assembly under rooftop gardens and landscaped roofs shall comply with Section 1505.

425.3 Structural fire resistance. The structural frame and roof construction supporting the load imposed upon the roof by the roof gardens or landscaped roofs shall comply with the requirements of Table 601.

425.4 Roof size. Rooftop garden or landscaped roof areas shall not exceed 15,625 square feet (1,450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a Class A-rated roof system complying with ASTM E 108 or UL 790 shall be provided between adjacent rooftop gardens or landscaped roof areas.

425.5 Rooftop structure and equipment clearance. For all vegetated roofing systems abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E 108 or UL 790 shall be achieved for a minimum 6-foot-wide (1.8 m) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports, and building service equipment.

425.6. Irrigation. Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

426.7 Fire protection systems. Buildings or structures that have rooftop gardens or landscaped roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the rooftop garden or landscaped roof is located in accordance with Section 905.3.8

425.8 Maintenance plan. A maintenance plan for vegetation placed on roofs shall be provided as required by Section 317 of the International Fire Code.

Revise as follows:

1507.16 Roof gardens and landscaped roofs. ~~Roof gardens and landscaped roofs shall comply with the requirements of this chapter and Sections 1607.12.3 and 1607.12.3.1 and the *International Fire Code*.~~

~~**1507.16.1 Structural fire resistance.**~~ The structural frame and roof construction supporting the load imposed upon the roof by the roof gardens or landscaped roofs shall comply with the requirements of Table 601.

Reason: This proposal seeks to bring the provisions for the construction of rooftop gardens and landscaped roofs which is currently only found in Section 317 of the IFC into the IBC. Many of the provisions found in IFC Section 317 (full text is shown below) are construction related, not maintenance. As such the appropriate place for these requirements is in the IBC with the maintenance provisions remaining in the IFC.

New IBC Section 425 will have the construction requirements for rooftop gardens and landscaped roofs with a reference to the IFC for maintenance items. The changes in Section 1507.16 are correlations with new Section 425. Section 425 now holds the pointers to the applicable IBC provisions and to the IFC for maintenance items.

The correlation between the existing text of Section 317 of the IFC and New Section 425 in the IBC is as follows:

425.1 General. (IFC 317.1)
425.2 Roof construction. (IFC 317.1)
425.3 Structural fire resistance. (IBC 1507.16)
425. 4 Roof size. (IFC 317.2)
425.5 Rooftop structure and equipment clearance. (IFC 317.3)
425.6. Irrigation. (IFC 317.4.3)
425.7 Fire protection systems. IBC 905.3.8
425.8 Maintenance plan. (IFC 317.5)

2012 IFC Section 317 reads as follows:

SECTION 317 ROOFTOP GARDENS AND LANDSCAPED ROOFS

317.1 General. *Rooftop gardens and landscaped roofs shall be installed and maintained in accordance with Sections 317.2 through 317.5 and Sections 1505.0 and 1507.16 of the International Building Code.*

317.2 Rooftop garden or landscaped roof size. *Rooftop garden or landscaped roof areas shall not exceed 15,625 square feet (1,450 m2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a Class A-rated roof system complying with ASTM E 108 or UL 790 shall be provided between adjacent rooftop gardens or landscaped roof areas.*

317.3 Rooftop structure and equipment clearance. *For all vegetated roofing systems abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E 108 or UL 790 shall be achieved for a minimum 6-foot-wide (1.8 m) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports, and building service equipment.*

317.4 Vegetation. *Vegetation shall be maintained in accordance with Sections 317.4.1 and 317.4.2.*

317.4.1 Irrigation*. Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.*

317.4.2 Dead foliage. *Excess biomass, such as overgrown vegetation, leaves and other dead and decaying material, shall be removed at regular intervals not less than two times per year.*

317.4.3 Maintenance plan. *The fire code official is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a roof garden, materials used, or when a fire hazard exists to the building or exposures due to the lack of maintenance.*

317.5 Maintenance equipment*. Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.*

Cost Impact: The code change proposal will not increase the cost of construction.

G98-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

425 (NEW)-G-RICE

G99–12
425 (NEW), Chapter 35

Proponent: Jane Malone, National Center for Healthy Housing (jmalone@nchh.org)

Revise as follows:

SECTION 425
RADON REDUCING CONSTRUCTION FEATURES FOR EDUCATIONAL BUILDING USES

425.1 General. Occupancies classified as Group E shall comply with the provisions of this section where the building is located in an area of High (Zone 1) Radon Potential as determined by Figure AF101 of Appendix F of the *International Residential Code*.

> **Exception.** Buildings complying with the radon resistant construction techniques for new construction in accordance with Chapter 2 of EPA 625-R-92-016.

425.2 Radon Reducing Construction Features. Buildings shall be equipped with the radon reducing features in Section 425.2.1 through 425.2.12.

425.2.1 Vapor Barrier. A continuous vapor barrier meeting ASTM E1745 Class A, B or C, with any seams overlapped not less than 12 inches (305 mm) and sealed, shall be installed under the slab in basement and slab-on-grade construction and on top of the soil in crawl space construction.

425.2.2 Base Course. Floors of basements and slab-on-grade construction shall be placed over a stone base course, not less than 4 inches (102 mm) in thickness. The stone base course shall have a void ratio of not less than 35 percent, or Size Number 4, 5 or 6 shall be used and shall meet the specifications of ASTM C33.

425.2.3 Solid Vent Pipe. Solid vent pipe shall be installed as follows:

1. Basement slabs with interior foundation pipe drains installed shall have solid 6 inch (153 mm) minimum diameter vent pipe sections installed in conjunction with this drainage system. One independent vent stack pipe shall be installed for every contiguous 15,000 square feet (1392 sq. m), or portion thereof, of slab area, terminating at an approved location, as prescribed in Section 425.2.9, on the exterior of the building. Basement slabs with french drains or channel drains shall not be permitted unless interior foundation pipe drains as described in this section are installed.
2. Excluding non-habitable spaces such as garages, basement slabs that do not have an interior foundation pipe drain, and slab-on-grade construction, shall be provided with one 6 inch (153 mm) minimum diameter solid vent pipe section with a "T" pipe fitting or equivalent for every contiguous 15,000 square feet (1392 sq. m), or portion thereof, of slab area, with this vent pipe section to be installed into the sub-slab aggregate. Each of the horizontal openings of the "T" pipe fitting shall be connected to a minimum of 10 feet (3 m) of 6 inch (153 mm) diameter perforated pipe or equivalent area soil gas collection plenum and placed in the sub-slab aggregate. The vertical portion of the "T" pipe fitting shall be connected to an independent solid vent stack pipe terminating at an approved location, as prescribed in Section 425.2.9, on the exterior of the building. Where more than one vent pipe section is provided, interconnection of these sections into a single independent vent stack is permitted for coverage up to a total area of 15,000 square feet (1392 sq. m) to permit use of a single in-line vent pipe fan when activation of the system is desired.
3. Crawl spaces shall be provided with one 6 inch (153 mm) minimum diameter solid vent pipe section with a "T" pipe fitting or equivalent for every contiguous 15,000 square feet (1392 sq. m), or portion thereof, of crawl space area. Each of the horizontal openings of the "T" pipe fitting shall be connected to a minimum of 10 feet (3 m) of 6 inch (153 mm) diameter perforated pipe or equivalent area soil gas collection plenum and installed upon the soil. The vertical portion of the

"T" pipe fitting shall be connected to an independent solid vent pipe terminating at an approved location on the exterior of the building.

4. In combination basement/crawl space or slab-on-grade/crawl space buildings, a 6 inch (153 mm) minimum diameter solid vent pipe is permitted to be provided between the areas and interconnected into the independent vent stack, for coverage up to a total area of 15,000 square feet (1392 sq. m) to permit use of a single in-line vent pipe fan where activation of the system is desired. Slabs areas divided by internal footings shall be permitted to be joined with piping into a single independent vent stack for coverage up to a total area of 15,000 square feet (1392 sq. m).

425.2.4 Joint and Penetration Sealing. Except for french drains or channel drains, joints in foundation walls and floors, including, without limitation, control joints between slab sections poured separately, and between foundation wall and floor, as well as all other openings and penetrations of the foundation walls and floor including, but not limited to, utility penetrations, shall be substantially sealed by utilizing a caulk complying with ASTM C920 class 25 or greater, in order to close off the soil gas entry routes. Prior to sealing, backer rods shall be used to fill gaps greater than one inch. Any openings or penetrations of the floor over the crawl space shall be substantially sealed in order to close off the soil gas entry routes.

425.2.5 Floor drains. Floor drains shall substantially close off the soil gas entry routes with a water-seal trap or other mechanical means.

425.2.6 Sump Cover. A sump cover which substantially closes off the soil gas entry routes shall be provided for all sump installations. Sump covers shall not be used as a vent pipe location.

425.2.7 Sealing. The following measures shall be provided:

1. No ductwork for supply or return air shall be routed through a crawl space or beneath a slab. Where ductwork passes through or beneath a slab, all openings and joints shall be seamless or properly taped or sealed water-tight.
2. Sealant materials that substantially close off the soil gas entry routes shall be installed on any doors or other openings between basements and adjoining crawl spaces that are vented to the exterior.
3. The tops of foundation walls, including, without limitation, interior ledges, that are constructed of hollow masonry units shall be capped or the voids shall be completely filled.
4. The vapor barrier in a crawlspace shall turn up onto the foundation walls not less than 12 inches (153 mm) and shall be sealed to the wall with a caulk complying with ASTM C920 class 25 or higher or equivalent method.

425.2.8 Vent Stack Installation. The independent vent stack pipe provided in accordance with this section shall be an adequately supported, gas tight, 6 inch (153 mm) minimum diameter solid pipe, through any enclosed portions of the building. Excluding a basement or crawl space, the pipe shall be routed in a manner that makes it accessible for the installation of a future in-line vent pipe fan in a non-conditioned space, and installed in a configuration, and supported in a manner, that will ensure that rain water or condensate accumulation within the pipes will drain downward into the ground beneath the slab or vapor barrier.

425.2.9 Vent Stack Termination. The vent stack pipe shall meet the following termination requirements:

1. Vent pipes shall terminate at least 24 inches (610 mm) above the roof, measured from the highest point where the vent intersects the roof. When a vent pipe extension terminates on an occupiable roof the vent pipe shall extend at least 10 feet (3 m) above the roof surface.

   Exception: Buildings more than three stories in height shall be allowed to extend vent pipe terminals through a wall provided that the termination is at least 20 feet (6 m) above grade and is effectively screened.
2. No vent terminal shall be located directly beneath any door, window, or other ventilating opening into the conditioned space of the building or of an adjacent building nor shall any such vent

terminal be within 25 feet (7620 mm) horizontally of such an opening unless it is at least 2 feet (610 mm) above the top of such opening.

3. No vent terminal shall be closer than 25 feet (7620 mm) horizontally from any lot line.

425.2.10 Labeling. Radon vent pipes shall be identifiable and clearly labeled as a radon reduction system at intervals of at least every 10 feet (7620 mm) and at least once in every room or space. The radon reduction system label of any section of vent pipe above the roof shall caution against placement of air intake valves within 10 feet (7620 mm) of the vent pipe discharge.

425.2.11 Electrical Connection for Fan. A dedicated electrical branch circuit terminating in an electrical box shall be installed proximate to each vent stack where a future in-line vent pipe fan and system failure alarms is likely to be installed.

425.2.12 Air Passages. In order to reduce stack effect, air passages that penetrate the conditioned envelope of the building, such as openings installed in top-floor ceilings, shall be closed, gasketed or otherwise sealed with materials approved for such applications.

Add new standard to Chapter 35 as follows:

ASTM

ASTM E 1745-11 Standard Specification for Plastic Water Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

US EPA Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

EPA 625-R-92-016-1994 Radon Prevention in the Design and Construction of Schools and Other Large Buildings.

Reason: The purpose of this requirement is to protect students, faculty, and other staff from exposure to radon gas in the educational environment. This proposed change will reduce radon exposure risk for humans in educational buildings that are constructed in known areas[1] of high radon potential.

The rate of exposure for children and staff in school buildings is second only to exposure in the home. [2] In the current ICC family of codes, provision for radon control, commonly known as radon-resistant new construction, is contained only in the optional Appendix F for the International Residential Code.

Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. [3] The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. [4] The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.

Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer. EPA recommends that all homes and schools be tested for radon. EPA recommends mitigation if radon is above 4 pCi/L (equivalent to EPA Radon Zone 1) and consideration of mitigation if radon is 2-4 pCi/L (equivalent to Zone 2). [5] In 2009, the World Health Organization released a report indicating that 100 Bq/m^3or 2.7 pCi/L should be the reference level for radon.[6]

This proposal consists of the subchapter 10 "Radon Hazard Sub-code of the New Jersey Uniform Construction Code" – which applies to all residential and educational uses – combined with revisions consistent with provisions that were accepted for the IGCC 2012. These provisions improve upon the New Jersey standard by improving the cost-efficiency and effectiveness of this existing radon standard.

[1] "Zone Maps," US EPA, http://www.epa.gov/radon/zonemap.html
[2] "Radon in Schools," US EPA, http://www.epa.gov/radon/pubs/schoolrn.html
[3] "Health Risks," US EPA, http://www.epa.gov/radon/healthrisks.html
[4] "Radon and Cancer," World Health Organization, http://www.who.int/mediacentre/factsheets/fs291/en/index.html
[5] "Health Risks," US EPA, http://www.epa.gov/radon/healthrisks.html
[6] "WHO Handbook on Radon," http://www.who.int/entity/ionizing_radiation/env/9789241547673/en/index.html

Cost Impact: This code change will increase the cost of construction. This change will also save lives.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 1745 and EPA 625-R-92-016 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G99-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

426 (NEW)-G-MALONE.doc

G100 – 12
425 (NEW), Chapter 35

Proponent: Jane Malone, National Center for Healthy Housing (jmalone@nchh.org)

Add new text as follows:

SECTION 425
RADON REDUCING CONSTRUCTION FEATURES FOR
GROUP R-2 OCCUPANCIES.

425.1. General. Group R-2 Occupancies shall comply with the provisions of this section if the building is located in an area of High (Zone 1) Radon Potential as determined by Figure AF101 of Appendix F of the *International Residential Code*.

Exception. Buildings complying with Chapter 2 of EPA 625-R-92-016.

425.2. Radon Reducing Construction Features. Buildings shall be equipped with radon reducing features in accordance with Sections 425.2.1 through 425.2.12.

425.2.1 Vapor Barrier. A continuous vapor barrier meeting ASTM E1745 Class A, B or C, with any seams overlapped not less than 12 inches (305 mm) and sealed, shall be installed under the slab in basement and slab-on-grade construction and on the soil in crawl space construction.

425.2.2 Base Course. Floors of basements and slab on grade construction shall be placed over a stone base course, not less than 4 inches (102 mm) in thickness. The stone base course shall have a void ratio of not less than 35 percent, or Size Number 4, 5 or 6 shall be used and shall meet the specifications of ASTM C33.

425.2.3 Solid Vent Pipe. Solid vent pipe shall be installed as follows:

1. Basement slabs with interior foundation pipe drains installed shall have solid 6 inch (153 mm) minimum diameter vent pipe sections installed in conjunction with this drainage system. One independent vent stack pipe shall be installed for every contiguous 15,000 square feet (1392 sq. m), or portion thereof, of slab area, terminating at an approved location, as prescribed in 425.2.9, on the exterior of the building. Basement slabs with French drains or channel drains shall not be allowed unless interior foundation pipe drains as described in this section are installed.
2. Basement slabs which do not have an interior foundation pipe drain, and slab on grade construction (excluding non-habitable spaces such as garages), shall be provided with one 6 inch (153 mm) minimum diameter solid vent pipe section with a "T" pipe fitting or equivalent for every contiguous 15,000 square feet (1392 sq. m), or portion thereof, of slab area, with this vent pipe section to be installed into the sub-slab aggregate. Each of the horizontal openings of the "T" pipe fitting shall be connected to a minimum of 10 feet (3 m) of 6 inch (153 mm) diameter perforated pipe or equivalent area soil gas collection plenum and placed in the sub-slab aggregate. The vertical portion of the "T" pipe fitting shall be connected to an independent solid vent stack pipe terminating at an approved location, as prescribed in 425.2.9, on the exterior of the building. Where more than one vent pipe section is provided, interconnection of these sections into a single independent vent stack is permitted for coverage up to a total area of 15,000 square feet (1392 sq. m) to permit use of a single in-line vent pipe fan if activation of the system is desired.
3. Crawl spaces shall be provided with one 6 inch (153 mm) minimum diameter solid vent pipe section with a "T" pipe fitting or equivalent for every contiguous 15,000 square feet (1392 sq. m), or portion thereof, of crawl space area. Each of the horizontal openings of the "T" pipe fitting shall be connected to a minimum of 10 feet (3 m) of 6 inch (153 mm) diameter perforated pipe or equivalent area soil gas collection plenum and installed upon the soil. The vertical portion of the

"T" pipe fitting shall be connected to an independent solid vent pipe terminating at an approved location on the exterior of the building.

4. In combination basement/crawl space or slab-on-grade/crawl space buildings, a 6 inch (153 mm) minimum diameter solid vent pipe may be provided between the areas and interconnected into the independent vent stack, for coverage up to a total area of 15,000 square feet (1392 sq. m) to permit use of a single in-line vent pipe fan if activation of the system is desired. Slabs areas divided by internal footings may be joined with piping into a single independent vent stack for coverage up to a total area of 15,000 square feet (1392 sq. m).

425.2.4 Joint and Penetration Sealing. Joints in foundation walls and floors, including, without limitation, control joints between slab sections poured separately, and between foundation wall and floor (except for French drains or channel drains), as well as all other openings and penetrations of the foundation walls and floor including, but not limited to, utility penetrations, shall be substantially sealed by utilizing a caulk complying with ASTM C920 class 25 or greater, in order to close off the soil gas entry routes. Prior to sealing, backer rods shall be used to fill gaps greater than one inch. Any openings or penetrations of the floor over the crawl space shall be substantially sealed in order to close off the soil gas entry routes.

425.2.5 Floor drains. Floor drains shall substantially close off the soil gas entry routes with a water-seal trap or other mechanical means.

425.2.6 Sump Cover. A sump cover which substantially closes off the soil gas entry routes shall be provided for all sump installations. Sump covers shall not be used as a vent pipe location.

425.2.7 Sealing. The following measures shall be provided:

1. No ductwork for supply or return air shall be routed through a crawl space or beneath a slab. Where ductwork passes through or beneath a slab, all openings and joints shall be seamless or properly taped or sealed water-tight.
2. Sealant materials that substantially close off the soil gas entry routes shall be installed on any doors or other openings between basements and adjoining crawl spaces that are vented to the exterior.
3. The tops of foundation walls, including, without limitation, interior ledges, that are constructed of hollow masonry units shall be capped or the voids shall be completely filled.
4. The vapor barrier in a crawlspace shall turn up onto the foundation walls not less than 12 inches (153 mm) and shall be sealed to the wall with a caulk complying with ASTM C920 class 25 or higher or equivalent method.

425.2.8 Vent Stack Installation. The independent vent stack pipe provided in accordance with this section shall be an adequately supported, gas tight, 6 inch (153 mm) minimum diameter solid pipe, through any enclosed portions of the building. The pipe shall be routed in a manner that makes it accessible for the installation of a future in-line vent pipe fan in a non-conditioned (not heated or cooled) space excluding a basement or crawl space, and installed in a configuration, and supported in a manner, that will ensure that rain water or condensate accumulation within the pipes will drain downward into the ground beneath the slab or vapor barrier.

425.2.9 Vent Stack Termination. The vent stack pipe shall meet the following termination requirements:

1. Vent pipes shall terminate at least 24 inches (610 mm) above the roof, measured from the highest point where the vent intersects the roof. When a vent pipe extension terminates on an occupiable roof the vent pipe shall extend at least 10 feet (3 m) above the roof surface.
   Exception: Buildings more than three stories in height shall be allowed to extend vent pipe terminals through a wall provided that the termination is at least 20 feet (6 m) above grade and is effectively screened.
2. No vent terminal shall be located directly beneath any door, window, or other ventilating opening into the conditioned space of the building or of an adjacent building nor shall any such vent

terminal be within 25 feet (7620 mm) horizontally of such an opening unless it is at least 2 feet (610 mm) above the top of such opening.

3. No vent terminal shall be closer than 25 feet (7620 mm) horizontally from any lot line.

425.2.10 Labeling. Radon vent pipes shall be identifiable and clearly labeled as a radon reduction system at intervals of at least every 10 feet (7620 mm) and at least once in every room or space. The radon reduction system label of any section of vent pipe above the roof shall caution against placement of air intake valves within 10 feet (7620 mm) of the vent pipe discharge.

425.2.11 Electrical Connection for Fan. A dedicated electrical branch circuit terminating in an electrical box shall be installed proximate to each vent stack where a future in-line vent pipe fan and system failure alarms may be installed.

425.2.12 Air Passages. In order to reduce stack effect, air passages that penetrate the conditioned envelope of the building, such as openings installed in top-floor ceilings, shall be closed, gasketed or otherwise sealed with materials approved for such applications.

Add new standard to Chapter 35 as follows:

ASTM

ASTM E 1745-11 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

US EPA Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

EPA 625-R-92-016-1994 Radon Prevention in the Design and Construction of Schools and Other Large Buildings.

Reason: The purpose of this requirement is to protect occupants from deadly exposure to radon gas in the multifamily residential environment. **This proposed change will reduce radon exposure risk for occupants of multifamily residential buildings that are constructed in known areas[1] of high radon potential.**

In the current ICC family of codes, provision for radon control, commonly known as radon-resistant new construction, is contained only in the optional Appendix F for the International Residential Code. We intend to propose changes to the IRC in 2013 to require radon resistant new construction in the next code change cycle.

Epidemiological studies confirm that radon increases the risk of lung cancer in the general population. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 21,000 lung cancer deaths each year are caused by radon exposure. [2] The World Health Organization estimates that between 3% and 14% of all lung cancer cases worldwide are caused by radon exposure. [3] The Surgeon General of the United States issued a Health Advisory in 2005 warning Americans about the health risk from exposure to radon in indoor air. Dr. Richard Carmona, the Nation's Chief Physician, urged Americans find out how much radon they might be breathing. Dr. Carmona also stressed the need to remedy the problem as soon as possible when the radon level is 4 pCi/L or more.

Radon is a colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a building through cracks in walls, basement floors, foundations and other openings. There is no known threshold concentration below which radon exposure presents no risk. Even low concentrations of radon can result in a small increase in the risk of lung cancer. EPA recommends that all homes and schools be tested for radon. EPA recommends mitigation if radon is above 4 pCi/L (equivalent to EPA Radon Zone 1) and consideration of mitigation if radon is 2-4 pCi/L (equivalent to Zone 2). [4] In 2009, the World Health Organization released a report indicating that 100 Bq/m^3or 2.7 pCi/L should be the reference level for radon.[5]

This proposal consists of the subchapter 10 "Radon Hazard Sub-code of the New Jersey Uniform Construction Code" – which applies to all residential and educational uses – combined with revisions consistent with provisions that were accepted for the IGCC 2012. These provisions improve upon the New Jersey standard by improving the cost-efficiency and effectiveness of this existing radon standard.

[1] "Zone Maps," US EPA, http://www.epa.gov/radon/zonemap.html
[2] "Health Risks," US EPA, http://www.epa.gov/radon/healthrisks.html
[3] "Radon and Cancer," World Health Organization, http://www.who.int/mediacentre/factsheets/fs291/en/index.html
[4] "Health Risks," US EPA, http://www.epa.gov/radon/healthrisks.html
[5] "WHO Handbook on Radon," http://www.who.int/entity/ionizing_radiation/env/9789241547673/en/index.html

Referenced Standards - New
ASTM E 1745 (attached)

Referenced Standards – Existing
ASTM C 33
ASTM C 920

Cost Impact: This code change will increase the cost of construction. This change will also save lives.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 1745 and EPA 625-R-92-016 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G100-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

425 (NEW) #2-G-MALONE

G101 – 12

406.6.1, [F] 415.8.1.1, [F] 415.8.2.1.1, Table 503, 503.1, 503.1.1, 503.1.2, 503.1.3, 504, 504.1, 504.1.1 (NEW), 504.1.2 (NEW), 504.1.3 (NEW),504.2, 504.3, Table 504.3 (NEW), 505.4, Table 504.4 (NEW), 506, 508.8, 507.8.1, 507.8.1.1, 507.8.4, 508.2.1, 508.2.2, 508.2.3, 510.2, 3102.4, 3102.5, 3412.6.1 (IEBC [B] 1412.6.1), 3412.6.1.1 (IEBC [B] 1412.6.1.1), 3412.6.2 (IEBC [B] 1412.6.2), 3412.6.2.1 (IEBC [B] 1412.6.2.1)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee

Revise as follows:

406.6.1 Heights and areas. Enclosed vehicle parking garages and portions thereof that do not meet the definition of *open parking garages* shall be limited to the allowable heights and areas specified in ~~Table 503~~ Sections 504 and 506 as modified by ~~Sections 504, 506 and~~ Section 507. Roof parking is permitted.

[F] 415.8.1.1 Type of construction and height exceptions. Buildings shall be constructed in compliance with the height, number of stories and area limitations ~~of Table 503~~ specified in Sections 504 and 506 for Group H-2; except that where erected of Type I or II construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type IV construction, the maximum *building height* shall be 65 feet (19 812 mm) and except further that, in isolated areas, the maximum *building height* of Type IV structures shall be increased to 85 feet (25 908 mm).

[F] 415.8.2.1.1 Height exception. Where storage tanks are located within a building no more than one *story above grade plane*, the height limitation of Section ~~503~~ 504 shall not apply for Group H.

SECTION 503
GENERAL BUILDING HEIGHT AND AREA LIMITATIONS

503.1 General. The *building height*, number of stories *and area* shall not exceed the limits specified in ~~Table 503~~ Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Building height, number of stories and area provisions shall be applied independently. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

503.1.1 Special industrial occupancies. Buildings and structures designed to house special industrial processes that require large areas and unusual *building heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the *building height*, number of stories *and area* limitations of ~~Table 503~~ specified in Sections 504 and 506.

503.1.2 Buildings on same lot. Two or more buildings on the same *lot* shall be regulated as separate buildings or shall be considered as portions of one building if the *building height*, number of stories of each building and the aggregate *building area* of the buildings are within the limitations of ~~Table~~ 503 as modified by specified in Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

503.1.3 Type I construction. Buildings of Type I construction permitted to be of unlimited tabular *building heights and areas* are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited *building height* in Sections 503.1.1 and 504.3.

~~TABLE 503~~
~~ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]~~
~~Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.~~
~~Building area limitations shown in square feet, as determined by the definition of "Area, building," per story~~

SECTION 504
BUILDING HEIGHT AND NUMBER OF STORIES

504.1 General. The ~~*building*~~ *height* ~~permitted by Table 503~~, in feet, and the number of stories of a building shall be ~~increased in accordance with Sections 504.2 and 504.3~~ determined based on the type of construction, occupancy classification, and whether or not there is an automatic sprinkler system installed throughout the building.

> **Exception:** The *building height* of one-*story* aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an *automatic sprinkler system* or *automatic fire-extinguishing system* in accordance with Chapter 9 and is entirely surrounded by *public ways* or *yards* not less in width than one and one-half times the *building height*.

504.1.1 Unlimited area buildings. The height of unlimited area buildings shall be designed in accordance with Section 507.

504.1.2 Special Provisions. The requirements in Section 510, "Special Provisions", shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable heights of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in Section 510.

504.1.3 Fire-resistance rating substitution. Where sprinklers are substituted for one hour construction in accordance with Table 601, Footnote d, the height and number of stories shall be determined based on the provisions applicable to buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

~~**504.2 Automatic sprinkler system increase.** Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one. These increases are permitted in addition to the *building area* increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one, but shall not exceed 60 feet (18 288 mm) or four *stories*, respectively.~~

> ~~**Exception:** The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions:~~
>
> 1. ~~Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.~~
> 2. ~~Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.~~
> 3. ~~Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.~~

504.2 Mixed occupancy. In a building containing mixed occupancies in accordance with Section 508, no individual occupancy shall exceed the height and number of story limits specified in this section for the applicable occupancies.

504.3 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table 504.3.

~~**504.3 Roof structures.**~~ **Exception:** Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.5. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable *building height* if of combustible materials (see Chapter 15 for additional requirements).

TABLE 504.3[a]
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A,B,E,F,M,S,U	NS[b]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
H-1, H-2, H-3, H-5	NS[c,d]	UL	160	65	55	65	55	65	50	40
	S									
H-4	NS[c,d]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1, I-3	NS[d,e]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-2	NS[d,f]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85						
I-4	NS[d,g]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
R	NS[d,h]	UL	160	65	55	65	55	65	50	40
	S13R	60	60	60	60	60	60	60	60	60
	S	UL	180	85	75	85	75	85	70	60

For SI: 1 foot = 304.8mm
UL = Unlimited
NS = Buildings not equipped throughout with an automatic sprinkler system.
S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

a. See Chapter 4 for specific exceptions to the allowable height in this Chapter 5.
b. See Section 903.2 for minimum sprinkler thresholds for specific occupancies.
c. New Group H occupancies required to be sprinklered in accordance with Section 903.2.5.
d. The NS value is only for use in evaluation of existing building height in accordance with Section 3412.6.1.
e. New Group I -1 and I-3 occupancies required to be sprinklered in accordance with Section 903.2.6. For New Group I-1 Occupancy, see also Section 903.2.6, Exceptions 1 and 2.
f. New and existing Group I-2 occupancies required to be sprinklered in accordance with Section 903.2.6 and IFC Section 1103.5.
g. New Group I-4 occupancies see Section 903.2.6 Exceptions 3 and 4.
h. New Group R occupancies required to be sprinklered in accordance with Section 903.2.8.

504.4 Number of stories. The maximum number of stories of a building shall not exceed the limits specified in Table 504.4.

TABLE 504.4[a,b]
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION					
	SEE	TYPE I	TYPE II	TYPE III	TYPE	TYPE V

	FOOT-NOTES							IV		
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	2	1
	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3
E	NS	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
F-1	NS	UL	11	4	2	3	2	4	2	1
	S	UL	12	5	3	4	3	5	3	2
F-2	NS	UL	11	5	3	4	3	5	3	2
	S	UL	12	6	4	5	4	6	4	3
H-1	NS[c,e]	1	1	1	1	1	1	1	1	NP
	S									
H-2	NS[c,e]	UL	3	2	1	2	1	2	1	1
	S									
H-3	NS[c,e]	UL	6	4	2	4	2	4	2	1
	S									
H-4	NS[c,e]	UL	7	5	3	5	3	5	3	2
	S	UL	8	6	4	6	4	6	4	3
H-5	NS[c,e]	4	4	3	3	3	3	3	3	2
	S									
I-1	NS[d,e]	UL	9	4	3	4	3	4	3	2
	S	UL	10	5	4	5	4	5	4	3
I-2	NS[e,f]	UL	4	2	1	1	NP	1	1	NP
	S	UL	5	3						
I-3	NS[d,e]	UL	4	2	1	2	1	2	2	1
	S	UL	5	3	2	3	2	3	3	2
I-4	NS[e,g]	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2
R-1	NS[e,h]	UL	11	4	4	4	4	4	3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3
R-2	NS[e,h]	UL	11	4	4	4	4	4	3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3
R-3	NS[e,h]	UL	11	4	4	4	4	4	3	3
	S13R	4	4						4	4
	S	UL	12	5	5	5	5	5	4	4
R-4	NS[e,h]	UL	11	4	4	4	4	4	3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	3	1

	S	UL	12	5	3	4	3	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	2
	S	UL	12	6	4	5	4	5	5	3
U	NS	UL	5	4	2	3	2	4	2	1
	S	UL	6	5	3	4	3	5	3	2

UL = Unlimited. NP = Not Permitted
NS = Buildings not equipped throughout with an automatic sprinkler system.
S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.
a. See Chapter 4 for specific exceptions to the allowable stories in this Chapter 5.
b. See Section 903.2 for minimum sprinkler thresholds for specific occupancies.
c. New Group H occupancies required to be sprinklered in accordance with Section 903.2.5.
d. New Group I-1 and I-3 occupancies required to be sprinklered in accordance with Section 903.2.6. For New I-1 Occupancy, see also Section 903.2.6, Exceptions 1 and 2.
e. The NS value is only for use in evaluation of existing building height in accordance with Section 3412.6.1.
f. New and existing Group I-2 occupancies required to be sprinklered in accordance with Section 903.2.6 and IFC Section 1103.5.
g. New Group I-4 occupancies see Section 903.2.6, Exceptions 3 and 4.
h. New Group R occupancies required to be sprinklered in accordance with Section 903.2.8.

SECTION 505
MEZZANINES AND EQUIPMENT PLATFORMS

(Portions of text not shown remain unchanged)

Delete and substitute as follows:

~~SECTION 506~~
~~BUILDING AREA MODIFICATIONS~~

~~**506.1 General.** The *building areas* limited by Table 503 shall be permitted to be increased due to frontage *(If)* and *automatic sprinkler system* protection *(Is)* in accordance with Equation 5-1:~~

~~*Aa* = {*At* + [*At* × *If*] + [*At* × *Is*]} **(Equation 5-1)**~~
~~where:~~
~~*Aa* = Allowable *building area* per *story* (square feet).~~
~~*At* = Tabular *building area* per *story* in accordance with Table 503 (square feet).~~
~~*If* = Area increase factor due to frontage as calculated in accordance with Section 506.2.~~
~~*Is* = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.~~

~~**506.2 Frontage increase.** Every building shall adjoin or have access to a *public way* to receive a *building area* increase for frontage. Where a building has more than 25 percent of its perimeter on a *public way* or open space having a width of not less than 20 feet (6096 mm), the frontage increase shall be determined in accordance with Equation 5-2:~~

~~*If* = [*F*/*P* - 0.25]*W*/30 **(Equation 5-2)**~~
~~where:~~
~~*If* = Area increase due to frontage.~~
~~*F* = Building perimeter that fronts on a *public way* or open space having 20 feet (6096 mm) open minimum width (feet).~~
~~*P* = Perimeter of entire building (feet).~~
~~*W* = Width of *public way* or open space (feet) in accordance with Section 506.2.1.~~

~~Weighted average $W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \ldots)/F$.~~ ~~**(Equation 5-3)**~~

~~where:~~

~~L_n = Length of a portion of the exterior perimeter wall.~~
~~w_n = Width of open space associated with that portion of the exterior perimeter wall.~~
~~F = Building perimeter that fronts on a *public way* or open space having a width of 20 feet (6096 mm) or more.~~

~~**Exception:** Where the building meets the requirements of Section 507, as applicable, except for compliance with the 60-foot (18 288 mm) *public way* or *yard* requirement, and the value of *W* is greater than 30 feet (9144 mm), the value of *W* divided by 30 shall be limited to a maximum of 2.~~

~~**506.2.2 Open space limits.** Such open space shall be either on the same *lot* or dedicated for public use and shall be accessed from a street or *approved fire lane*.~~

~~**506.3 Automatic sprinkler system increase.** Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the *building area* limitation in Table 503 is permitted to be increased by an additional 200 percent (I_s = 2) for buildings with more than one *story above grade plane* and an additional 300 percent (I_s = 3) for buildings with no more than one *story above grade plane*. These increases are permitted in addition to the height and *story* increases in accordance with Section 504.2.~~

~~**Exception:** The use of an *automatic sprinkler system* to increase the building area limitation shall not be permitted for the following conditions:~~

~~1. Buildings classified as a Group H-1 occupancy.~~
~~2. Buildings, or portions of buildings, classified as either a Group H-2 or H-3 occupancy. For buildings containing such occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.~~
~~3. Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.~~

~~**506.4 Single occupancy buildings with more than one story.** The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined in accordance with this section. The actual aggregate *building area* at all *stories* in the building shall not exceed the total allowable *building area*.~~

~~**Exception:** A single *basement* need not be included in the total allowable *building area*, provided such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*.~~

~~**506.4.1 Area determination.** The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined by multiplying the allowable *building area* per *story* (A_a), as determined in Section 506.1, by the number of *stories above grade plane* as listed below:~~

~~1. For buildings with two *stories above grade plane*, multiply by 2;~~
~~2. For buildings with three or more *stories above grade plane*, multiply by 3; and~~
~~3. No *story* shall exceed the allowable *building area* per *story* (A_a), as determined in Section 506.1, for the occupancies on that *story*.~~

~~**Exceptions:**~~

~~1. Unlimited area buildings in accordance with Section 507.~~

~~2. The maximum area of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per *story (Aa)*, as determined in Section 506.1, by the number of *stories above grade plane*.~~

~~**506.5 Mixed occupancy area determination.** The total allowable *building area* for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single *basement* need not be included in the total allowable *building area*, provided such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*.~~

~~**506.5.1 No more than one story above grade plane.** For buildings with no more than one *story above grade plane* and containing mixed occupancies, the total *building area* shall be determined in accordance with the applicable provisions of Section 508.1.~~

~~**506.5.2 More than one story above grade plane.** For buildings with more than one *story above grade plane* and containing mixed occupancies, each *story* shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three *stories above grade plane*, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* based on the applicable provisions of Section 508.1 shall not exceed 3.~~

SECTION 506
BUILDING AREA

506.1 General. The floor area of a building shall be determined based on the type of construction, occupancy classification, whether or not there is an automatic sprinkler system installed throughout the building, and the amount of building frontage on public way or open space.

506.1.1 Unlimited area buildings. Unlimited area buildings shall be designed in accordance with Section 507.

506.1.2 Special Provisions. The requirements in Section 510, “Special Provisions”, shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable areas of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in Section 510.

506.1.3 Fire-resistance rating substitution. Where sprinklers are substituted for one hour construction in accordance with Table 601, Footnote d, the floor area of the building shall be determined based on the provisions applicable to buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

506.1.4 Basements. Single story basements need not be included in the total allowable floor area of a building provided the total basement floor area does not exceed that permitted for a one-story building.

506.2 Allowable area determination. The allowable area of a building shall be determined in accordance with the applicable provisions of Sections 506.2.1 through 506.2.4 and Section 506.3.

506.2.1 Single occupancy, one-story buildings. The allowable area of a single occupancy building with no more than one story above grade plane shall be determined in accordance with Equation 5-1:

$A_a = A_t + (NS \times I_f)$ **(Equation 5-1)**

where:

A_a = Allowable area (square feet).
A_t = Tabular allowable area factor (NS, S1, or S13R value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building

(regardless of whether or not the building is sprinklered).

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

506.2.2 Mixed occupancy, one-story buildings. The allowable area of a mixed occupancy building with no more than one story above grade plane shall be determined in accordance with the applicable provisions of Section 508.1.

506.2.2.1 Group H-2 or H-3 mixed occupancies. For a building containing Group H-2 or H-3 occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.

506.2.3 Single occupancy, multi-story buildings. The allowable area of a single occupancy building with more than one story above grade plane shall be determined in accordance with Equation 5-2:

$A_a = [A_t + (NS \times I_f)] \times S_a$ (**Equation 5-2)**

where:

A_a = Allowable area (square feet).
A_t = Tabular allowable area factor (NS, S13R, or SM value, as applicable) in accordance with Table 506.2.
NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is sprinklered).
I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.
S_a = Actual number of building stories above grade plane, not to exceed 3. For buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed 4.
No individual story shall exceed the allowable area (A_a) as determined by Equations 5-2 using the value of S_a = 1.

506.2.4 Mixed occupancy, multi-story buildings. Each story of a mixed occupancy building with more than one story above grade plane shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed 3.

506.2.4.1 Group H-2 or H-3 mixed occupancies. For a building containing Group H-2 or H-3 occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.

TABLE 506.2[a,b]
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
	S1	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000
	SM	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500
A-2	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-3	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-4	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S1	UL	UL	UL	UL	UL	UL	UL	UL	UL
	SM	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000
E	NS	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500	9.500
	S1	UL	UL	106,000	58,000	94,000	58,000	102,000	74,000	38,000
	SM	UL	UL	79,500	43,500	70,500	43,500	76,500	55,500	28,500
F-1	NS	UL	UL	25,000	15,500	19,000	12,000	33,500	14,000	8.500
	S1	UL	UL	100,000	62,000	76,000	48,000	134,000	56,000	34,000
	SM	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000	25,500
F-2	NS	UL	UL	37,500	23,000	28,500	18,000	50,500	21,000	13,000
	S1	UL	UL	150,000	92,000	114,000	72,000	202,000	84,000	52,000
	SM	UL	UL	112,500	69,000	85,500	54,000	151,500	63,000	39,000
H-1	NSc	21,000	16,500	11,000	7,000	9.500	7,000	10,500	7,500	NP
	S1									
H-2	NSc	21,000	16,500	11,000	7,000	9.500	7,000	10,500	7,500	3,000
	S1									
	SM									
H-3	NSc	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000	5,000
	S1									
	SM									
H-4	NSc,d	UL	UL	37,500	17,500	28,500	17,500	36,000	18,000	6,500
	S1	UL	UL	150,000	70,000	114,000	70,000	144,000	72,000	26,000
	SM	UL	UL	112,500	52,500	85,500	52,500	108,000	54,000	19,500
H-5	NSc,d	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108000	54,000	27,000
I-1	NSd,e,f	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500	4,500
	S1	UL	220,000	76,000	40,000	66,000	40,000	72,000	42,000	18,000
	SM	UL	165,000	57,000	30,000	49,500	30,000	54,000	31,500	13,500

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
I-2	NSd,g	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP
	S1	UL	UL	60,000	44,000	48,000	NP	48,000	38,000	NP
	SM	UL	UL	45,000	33,000	36,000	NP	36,000	28,500	NP
I-3	NSd,e	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000
	S1	UL	UL	45,000	40,000	42,000	30,000	48,000	30,000	20,000
	SM	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500	15,000
I-4	NSd,e,h	UL	60.500	26,500	13,000	23,500	13,000	25,500	18,500	9,000
	S1	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000	36,000
	SM	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500	27,000
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000
R-1	NSd,i	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S13R									
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000
R-2	NSd,i	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S13R									
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000
R-3	NSd,i	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S13R									
	S1									
	SM									
R-4	NSd,i	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S13R									
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000
S-1	NS	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000
	S1	UL	192,000	104,000	70,000	104,000	70,000	102,000	56,000	36,000
	SM	UL	144,000	78,000	52,500	78,000	52,500	76,500	42,000	27,000
S-2	NS	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500
	S1	UL	316,000	156,000	104,000	156,000	104,000	154,000	84,000	54,000
	SM	UL	237,000	117,000	78,000	117,000	78,000	115,500	63,000	40,500
U	NS	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000	5,500
	S1	UL	142,000	76,000	34,000	56,000	34,000	72,000	36,000	22,000
	SM	UL	106,500	57,000	25,500	42,000	25,500	54,000	27,000	16,500

For SI: 1 square foot = $0.0929m^2$

UL = Unlimited, NP = Not permitted.
NS = Buildings not equipped throughout with an automatic sprinkler system.

S1 = Buildings maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

a. See Chapter 4 for specific exceptions to the allowable area in this Chapter 5.
b. See Section 903.2 for minimum sprinkler thresholds for specific occupancies.
c. New Group H occupancies required to be sprinklered in accordance with Section 903.2.5.
d. The NS value is only for use in evaluation of existing building area in accordance with Section 3412.6.2.
e. New Group I-1 and I-3 occupancies required to be sprinklered in accordance with Section 903.2.6.
f. For New I-1 Occupancy, see also Section 903.2.6, Exceptions 1 and 2.
g. New and existing I-2 occupancies required to be sprinklered in accordance with Section 903.2.6 and IFC Section 1103.5.
h. New Group I-4 occupancies see Section 903.2.6, Exceptions 3 and 4.
i. New Group R occupancies required to be sprinklered in accordance with Section 903.2.8.

506.3 Frontage increase. Every building shall adjoin or have access to a *public way* to receive an area factor increase based on frontage. Area factor increase shall be determined in accordance with Sections 506.3.1 through 506.3.3.

506.3.1 Minimum percentage of perimeter. To qualify for an area factor increase based on frontage, a building shall have not less than 25 percent of its perimeter on a *public way* or open space. Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or *approved fire lane.*

506.3.2 Minimum frontage distance. To qualify for an area factor increase based on frontage, the *public way* or open space adjacent to the building perimeter shall have a minimum distance (W) of 20 feet (6096 mm) measured at right angles from the building face to any of the following:

1. The closest interior lot line.
2. The entire width of a street, alley or public way.
3. To the exterior face of an adjacent building on the same property.

Where the value of *W* is greater than 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the building area increase based on frontage, regardless of the actual width of the *public way* or open space. Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-4 shall be based on the weighted average calculated in accordance with Equation 5-3.

$$W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \ldots)/F \qquad \textbf{(Equation 5-3)}$$

where:

W (Width: weighted average) = Calculated width of public way or open space (feet).
L_n = Length of a portion of the exterior perimeter wall.
w_n = Width (≥ 20 feet) of a public way or open space associated with that portion of the exterior perimeter wall.
F = Building perimeter that fronts on a *public way* or open space having a width of 20 feet (6096 mm) or more.

Exception: Where the building meets the requirements of Section 507, as applicable, except for compliance with the minimum 60-foot (18 288 mm) *public way* or *yard* requirement, and the value of *W* is greater than 30 feet (9144 mm), the value of *W* shall not exceed 60 feet (18 288 mm).

506.3.3 Amount of increase. The area factor increase based on frontage shall be determined in accordance with the following:

$I_f = [F/P - 0.25]W/30$ **(Equation 5-4)**

where:

I_f = Area factor increase due to frontage.
F = Building perimeter that fronts on a *public way* or open space having minimum distance of 20 feet (6096 mm).
P = Perimeter of entire building (feet).
W = Width of *public way* or open space (feet) in accordance with Section 506.3.2.

Revise as follows:

507.8 Group H-2, H-3 and H-4 occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F and S occupancies in accordance with Sections 507.3 and 507.4 and the provisions of Sections 507.8.1 through 507.8.4.

507.8.1 Allowable area. The aggregate floor area of Group H occupancies located in an unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in ~~Table 503 as modified by Section 506.2~~ Section 506 based upon the perimeter of each Group H floor area that fronts on a *public way* or open space.

507.8.1.1 Located within the building. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations for the Group H occupancies as specified in ~~Table 503~~ Section 506.

507.8.4 Height limitations. For two-*story* unlimited area buildings, Group H occupancies shall not be located more than one *story above grade plane* unless permitted based on the allowable height ~~in~~ and number of *stories* and feet as ~~set forth in Table 503 for~~ specified in Section 504 based on the type of construction of the unlimited area building.

~~**508.2.1 Area limitations.** Aggregate accessory occupancies shall not occupy more than 10 percent of the *building area* of the *story* in which they are located and shall not exceed the tabular values in Table 503, without *building area* increases in accordance with Section 506 for such accessory occupancies.~~

~~**508.2.2**~~ **508.2.1 Occupancy classification.** Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.

508.2.2 Allowable building height. The allowable height and number of stories of the building shall be in accordance with Section 504 for the main occupancy of the building. The allowable height and number of stories for each accessory occupancy shall not exceed the tabular values for nonsprinklered buildings in Table 504.3 and Table 504.4 for such accessory occupancy.

~~**508.2.3 Allowable building area and height.** The allowable *building area and height* of the building shall be based on the allowable *building area and height* for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1.~~

508.2.3 Allowable building area. The allowable area of the building shall be based on the applicable provisions of Section 506 for the main occupancy of the building. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the story in which they are located and shall not exceed the tabular values for nonsprinklered buildings in Table 506.2 for each such accessory occupancies.

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:

1. through 6. *(no change)*
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section ~~503~~ 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

3102.4 Allowable floor areas. The area of a membrane structure shall not exceed the limitations ~~set forth in Table 503, except as provided in~~ specified in Section 506.

3102.5 Maximum height. Membrane structures shall not exceed one *story* nor shall such structures exceed the height limitations in feet ~~set forth in Table 503~~ specified in Section 504.3.

Exception: Noncombustible membrane structures serving as roofs only.

3412.6.1 (IEBC [B] 1412.6.1) Building height and number of stories. The value for building height and number of stories shall be the lesser value determined by the formula in Section 3412.6.1.1. ~~Chapter 5~~ Section 504 shall be used to determine the allowable height and number of stories of the building~~, including allowable increases due to automatic sprinklers as provided for in Section 504.2.~~ Subtract the actual *building height* in feet from the allowable and divide by 12 1/2 feet. Enter the height value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.1, Building Height, for fire safety, means of egress and general safety. The maximum score for a building shall be 10.

3412.6.1.1 (IEBC [B] 1412.6.1.1) Height formula. The following formulas shall be used in computing the building height value.

Height value, feet = $\frac{(AH)-(EBH)}{12.5} \times CF$ **(Equation 34-1)**

Height value, feet = $(AS - EBS) \times CF$ **(Equation 34-2)**

where:

AH = Allowable height in feet from ~~Table 503~~ Section 504.
EBH = Existing *building height* in feet.
AS = Allowable height in stories from ~~Table 503~~ Section 504.
EBS = Existing building height in stories.
CF = 1 if (*AH*) – (*EBH*) is positive.
CF = Construction-type factor shown in Table 3412.6.6(2) if (*AH*) – (*EBH*) is negative.

Note: Where mixed occupancies are separated and individually evaluated as indicated in Section 3412.6, the values AH, AS, EBH and EBS shall be based on the height of the occupancy being evaluated.

3412.6.2 (IEBC 1412.6.2) Building area. The value for building area shall be determined by the formula in Section 3412.6.2.2. Section ~~503~~ 506 and the formula in Section 3412.6.2.1 shall be used to determine the allowable area of the building. ~~This shall include any allowable increases due to frontage and automatic sprinklers as provided for in Section 506.~~ Subtract the actual *building area* in square feet from the allowable and divide by 1,200 square feet. Enter the area value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.2, Building Area, for fire safety, means of egress and general safety. In determining the area value, the maximum permitted positive value for area is 50 percent of the fire safety score as *listed* in Table 3412.8, Mandatory Safety Scores.

3412.6.2.1 (IEBC [B] 1412.6.2.1) Allowable area formula. The following formula shall be used in computing allowable area:

~~$Aa = \{At + [At \times If] + [At \times Is]\}$~~ ~~**(Equation 34-3)**~~

$A_a = A_t + (\mathrm{NS} \times I_f)$ **(Equation 34-3)**

where:

Aa = Allowable *building area* per story (square feet).
At = Tabular ~~*building*~~ allowable *area* ~~per story~~ factor (NS, S1, S13R, or SM value, as applicable) in accordance with Table ~~503~~ 506.2 ~~(square feet)~~.
NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is sprinklered).
~~*Is* = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.~~
If = Area factor increase ~~factor~~ due to for frontage as calculated in accordance with Section ~~506.2~~ 506.3.

Reason: This proposal rewrites current IBC allowable area and height provisions in an attempt to provide an increased degree of user friendliness and technical consistency to these fundamental requirements. To anyone not looking very closely at this code proposal, it may appear to be a dramatic change from current provisions, but the BCAC can assure you that it is not. Although this proposal modifies the format and technical language for allowable area and height determination, for all intents and purposes it can be regarded as being an editorial code change. That is, the code user will achieve exactly the same design solution in the 2015 IBC using the proposed improved methodology as that which results from the 2012 IBC.

Currently, Section 503.1 references Table 503 as the starting point of allowable area and height determination. This proposal references the code text Sections 504, “Building Height and Number of Stories”, and 506, “Building Area”, as the starting point that will now give structure to the design process. Existing Table 503, that represented unmodified base allowable area and height data, has been separated into three specific tables and placed in context at the appropriate technical sections for the design or review process. Table 504.3, “Allowable Building Height in Feet Above Grade Plane”, Table 504.4, “Allowable Number of Stories Above Grade Plane” and Table 506.2, “Allowable Area Factor”, now provide the allowable value based on the three (3) required variables to determine the height and area of a building:

1. Occupancy classification of the building
2. Type of construction of the building, and
3. Whether or not the building is sprinklered and if it is sprinklered, the type of sprinkler system provided.

Inputting the above-required variables into these three revised tables effectively eliminates all the many exceptions currently found in Sections 504.2 and 506.3, reducing the possibility of an error of omission or misunderstanding that is common with some users of the Code. The exceptions in the 2012 IBC Sections 504.2 and 506.3 were seamlessly incorporated into the new Tables so there is no way of misinterpreting what is required under the Code. Also, new footnotes in the revised tables will now correlate the mandatory sprinkler requirements in Section 903 with the height and area requirements in Chapter 5.

Using revised Section 504 that references Tables 504.3 & 504.4 makes determining the allowable building height in feet, and number of stories a very straight-forward exercise. Simply enter the appropriate table based on the applicable construction type, occupancy classification and sprinkler protection variables to determine the allowable value (and you are finished!). The footnotes in the tables provide the necessary cross-references and amplification for general specific exceptions under Chapter 4, Chapter 9 or Chapter 34. This is the first time that the height and area calculations in the Code Tables have been correlated with the sprinkler thresholds in Section 903 that were missed by many code users in the past.

Allowable building area determination is formula driven using the allowable area factor values in new Table 506.2 which are the existing values in the current 2012 IBC Table 503; however, the added values for “S1” & “SM” are multiplied out for use with the single story and multi-story sprinklered buildings. The “S1” (one story building sprinklered per NFPA 13) value is the “NS” (Nonsprinklered) value multiplied by 4 (old base Table value + 3 times the old Table value), the “SM” (multi-story building sprinklered per NFPA 13) value is the “NS” (Nonsprinklered) value multiplied by 3 (old base Table value + 2 times the old Table value), and the S13R (building sprinklered per NFPA 13R) value is the same value as the “NS” (Nonsprinklered) value. Sections 506.2.1, 506.2.2, 506.2.3 and 506.2.4 provide specific procedures and the formulas for allowable area determination based on tabular values chosen from Table 506.2 based on the building under consideration and on the frontage increase calculated under Section 506.3. The Section 506.3, “frontage increase”, provisions have been reworded to clarify the existing frontage increase determination procedure. Accounting for potential building area increases by sequentially starting at Section 506.1 and ending at 506.3.3 will provide the total allowable building area without referring back and forth between non-sequentially arranged code sections, Table 503 and footnotes as is the current procedure with the 2012 IBC.

A comparison of the 2012 and 2015 allowable area and height determination procedures reveals a much more simple process and identical answers to the exercise:

GIVEN:
Occupancy classification: Group B

Actual number of stories: 4
Actual Height above grade plane: 80'
Actual floor area/story = 100,000 sq. ft. (400,000 aggregate floor area for the entire building)
Type of construction: Type IIA
Sprinkler protection: NFPA 13
Frontage: around the entire building has 50 feet open space (100% open)

DETERMINE:
Total allowable building area and height in feet and stories.

2012 IBC Procedure:

Step 1: Read charging language at Section 503.1.

Step 2: Read charging language at Section 504.1.

Step 3: Read Section 504.2 and note that sprinklered building receives 20' increase and one story increase in height in Table 503 if none of the exceptions in Section 504.2 are applicable.

Step 4: Obtain tabular data from Table 503 (yields 65 ft and 5 stories) and apply increases from Step 3 (yields: <u>85 ft > 80 ft actual ✓</u>and <u>6 stories > 4 stories actual ✓)</u>

Step 5: Read Section 506.1 and then go to Table 503 to get A_t value (yields 37,500 sq. ft.) for use in Equation 5-1

Step 6: Read Section 506.2 and determine applicable allowable area frontage increase from Equations 5-2 & 5-3 (yields I_f = 0.75).

Step 7: Read Section 506.6 and its exceptions and determine applicable allowable area sprinkler increase from Section 506.3 (yields I_s = 2).

Step 8: Solve for A_a in Equation 5-1 in Section 506.1 using values obtained in Steps 5-7 (yields A_a =140,625 sf).

Step 9: Read Section 506.4 and determine total building area for this 4 story building using Section 506.4.1(2) (yields 3 x 140, 625 = <u>421,875 sq. ft. > 400,000 sq. ft. actual ✓</u>).

Step 10: Determine maximum allowable per story for this 4 story building using Section 506.4.1(3) (yields from Step 8 = <u>140,624 sq. ft. > 100,000 sq. ft. actual ✓</u>). Finished.

2015 IBC Procedure:

Step 1: Read charging language at Section 503.1.
Step 2: Read charging language at Section 504.1.
Step 3: Read Sections 504.1 to Section 504.3 and determine allowable building height in feet from Section Table 504.3 (yields <u>85 ft > 80 ft actual ✓</u>).
Step 4: Read Section 504.4 and determine allowable building height in stories from Section Table 504.4 (yields: <u>6 stories > 4 stories actual ✓</u>)).
Step 5: Read Sections 506.1 to 506.2.3 and determine the values required for determining maximum building floor area in Equations 5-2 (yields A_t from Table 506.2 as 112,500 sq. ft for SM value, 37,500 sq. ft for NS value, S_a = 3, and to determine I_f need to go Section 506.3 (See Step 6))
Step 6: Read Section 506.3 to 506.3.3 and determine applicable allowable area frontage increase from Equations 5-2 & 5-3 (yields I_f = 0.75).
Step 7: Using values obtained in Steps 5 & 6 determine the maximum building floor area using Equations 5-2 (yields 112,500 x 37,500(0.75) x 3 =<u>421,875 sq. ft. > 400,000 sq. ft. actual ✓</u>).
Step 8: Determine maximum allowable per story for this 4 story building using Equation 5-2 with S_a = 1 (yields 112,500 x 37,500(0.75) x 1 =<u>140,625 sq. ft. > 100,000 sq. ft. actual ✓</u>). Finished.

Several other sections other than Sections 503, 504 and 506 that referenced Table 503 directly have been revised to correlate the proper cross-reference to the revised allowable area and height determination procedures.

This proposal combines, organizes and rewords former allowable area and height provisions that resulted in a somewhat confusing multi-step process for value determination that new code users had a very difficult time learning. Through an improved sequential format and technical consolidation, this process has been greatly simplified resulting in consistency for area and height determinations.

In summary, all current technical provisions relative to allowable area and height determination have been retained. This code proposal is intended to greatly improve the functionality and consistency of the International Building Code in this fundamental, and important, area of allowable area and height determination.

Please review the following matrixes that account for the 2012 vs. 2015 IBC locations for relative technical requirements made by this code proposal.

2012 IBC Table	Proposed 2015 IBC Table
Table 503	Table 504.3 for Height in Feet

	Table 504.4 for Height in Stories
	Table 506.2 for Allowable Area Factor
Table 503 Footnote "a.1"	Sprinkler increase due to height built into Table 504.3. Sprinkler increase due to stories built into Table 504.4.
Table 503 Footnote "a.2"	New format of the title of Table 506.2 and revised layout and calculation method in Section 506.2 using Equations 5-1 & 5-2 eliminate the need for Footnote "a.2"
Table 503 Footnote "a.3"	Sprinkler increase due to area built into Table 506.2
Table 503 Footnote "a.4"	Sections 504.1.1 & 506.1.1
Table 503 Footnote "b"	Table 504.3 Footnote "a" Table 504.4 Footnote "a" Table 506.2 Footnote "a"
2012 IBC Section	Proposed 2015 IBC Section/Table
503.1	503.1
503.1.1	503.1.1
503.1.2	503.1.2
503.1.3	503.1.3
504.1	504.1
504.1 Exception	504.1 Exception
504.2	Table 504.3 & Table 504.4
504.2 Exception #1	Table 504.3 & Table 504.4 under the rows for Group I-2 and the columns for Construction Types IIB, III, IV and V.
504.2 Exception #2	Table 504.3 & Table 504.4 under the rows for Groups H-1, H-2, H-3 and H-5
504.2 Exception #3	Section 504.1.3
504.3	504.3 Exception
506.1	506.2.1 Equation 5-1 and 506.2.3 Equation 5-2
506.2	506.3.3
506.2 Equation 5-2	506.3.3 Equation 5-4
506.2.1	506.3.2
506.2.1 Equation 5-3	506.3.2 Equation 5-3
506.2.1 Exception	506.3.2 Exception
506.2.2	506.3.1
506.3	Table 506.2 in the rows for each occupancy
506.3 Exception #1	Table 506.2 in the rows for H-1 occupancy
506.3 Exception #2	506.2.2.1 and 506.2.4.1
506.3 Exception #3	506.1.3
506.4	506.2.3
506.4 Exception	506.1.4
506.4.1	506.2.1 (Equation 5-1) for one story building 506.2.3 (Equation 5-2 with S_a value)
506.4.1 Exception #1	506.1.1
506.4.1 Exception #2	506.2.3 (built into S_a value description)
506.5	506.1.4
506.5.1	506.2.2
506.5.2	506.2.4

Changes shown in Table below in legislative format:

2012 IBC Table	Proposed 2015 IBC Table
Table 503	Table 504.3 for Height in Feet
	Table 504.4 for Height in Stories
	Table 506.2 for Allowable Area Factor
Table 503 Footnote "a.1" a. See the following sections for general exceptions to Table 503: 1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.	Sprinkler increase due to height built into Table 504.3. Sprinkler increase due to stories built into Table 504.4.
Table 503 Footnote "a.2"	New format of the title of Table 506.2 and revised layout and

a. See the following sections for general exceptions to Table 503: 2. Section 506.2, Allowable building area increase due to street frontage.	calculation method in Section 506.2 using Equations 5-1 & 5-2 eliminate the need for Footnote “a.2”
Table 503 Footnote “a.3” a. See the following sections for general exceptions to Table 503: 3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.	Sprinkler increase due to area built into Table 506.2
Table 503 Footnote “a.4” a. See the following sections for general exceptions to Table 503: 4. Section 507, Unlimited area buildings.	**504.1.1 Unlimited area buildings.** The height of unlimited area buildings shall be designed in accordance with Section 507. **506.1.1 Unlimited area buildings.** Unlimited area buildings shall be designed in accordance with Section 507.
Table 503 Footnote “b” b See Chapter 4 for specific exceptions to the allowable height and areas in Chapter 5.	Table 504.3 Footnote “a” a. See Chapter 4 for specific exceptions to the allowable height in this Chapter 5. Table 504.4 Footnote “a” a. See Chapter 4 for specific exceptions to the allowable stories in this Chapter 5. Table 506.2 Footnote “a” a. See Chapter 4 for specific exceptions to the allowable area in this Chapter 5.
2012 IBC Section	Proposed 2015 IBC Section/Table
503.1 General. The *building height and area* shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.	**503.1 General.** The *building height*, number of stories *and area* shall not exceed the limits specified in ~~Table 503~~ Sections 504 and 506 based on the type of construction as determined by Section 602 and the ~~occupancies~~ occupancy classification as determined by Section 302, except as modified hereafter. Building height, number of stories and area provisions shall be applied independently. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.
503.1.1 Special industrial occupancies. Buildings and structures designed to house special industrial processes that require large areas and unusual *building heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the *building height and area* limitations of Table 503.	**503.1.1 Special industrial occupancies.** Buildings and structures designed to house special industrial processes that require large areas and unusual *building heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the *building height*, number of stories *and area* limitations ~~of Table 503~~ specified in Sections 504 and 506.
503.1.2 Buildings on same lot. Two or more buildings on the same *lot* shall be regulated as separate buildings or shall be considered as portions of one building if the *building height* of each building and the aggregate *building area* of the buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.	**503.1.2 Buildings on same lot.** Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the *building height*, number of stories of each building and the aggregate *building area* of the buildings are within the limitations ~~of Table 503~~ specified in Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.
503.1.3 Type I construction. Buildings of Type I construction permitted to be of unlimited tabular *building heights and areas* are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited *building height* in Sections 503.1.1 and 504.3 or increased *building heights and areas* for other types of construction.	**503.1.3 Type I construction.** Buildings of Type I construction permitted to be of unlimited tabular *building heights and areas* are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited *building height* in Sections 503.1.1 and 504.3.Exception or increased *building heights and areas* for other types of construction. (No Change to text)
504.1 General. The *building height* permitted by Table 503 shall be increased in accordance with Sections 504.2 and	**504.1 General.** The ~~building~~ height, in feet, and the number of stories of a building ~~permitted by Table 503~~ shall be ~~increased in~~

504.3.	~~accordance with Sections 504.2 and 504.3~~ determined based on the type of construction, occupancy classification, and whether or not there is an automatic sprinkler system installed throughout the building.
504.1 Exception: The *building height* of one-*story* aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an *automatic sprinkler system* or *automatic fire-extinguishing system* in accordance with Chapter 9 and is entirely surrounded by *public ways* or *yards* not less in width than one and one-half times the *building height*.	**504.1 Exception:** The *building height* of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by *public ways* or *yards* not less in width than one and one-half times the *building height*.
504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one. These increases are permitted in addition to the *building area* increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one, but shall not exceed 60 feet (18 288 mm) or four *stories*, respectively.	Built into Table 504.3 & Table 504.4.
504.2 Exception 1: The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions: 1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.	Built into Table 504.3 & Table 504.4 under the rows for Group I-2 and the columns for Construction Types IIB, III, IV and V.
504.2 Exception 2: The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions: 2. Buildings, or portions of buildings, classified as aGroup H-1, H-2, H-3 or H-5 occupancy.	Built into Table 504.3 & Table 504.4 under the rows for Groups H-1, H-2, H-3 and H-5
504.2 Exception 3: The use of an *automatic sprinkler system* to increase *building heights* shall not be permitted for the following conditions: 3. Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.	**504.1.3 Fire-resistance rating substitution.** Where sprinklers are substituted for one hour construction in accordance with Table 601, Footnote d, the height and number of stories shall be determined based on the provisions applicable to buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
504.3 Roof structures. Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.5. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable *building height* if of combustible materials (see Chapter 15 for additional requirements).	**Exception:** ~~**504.3 Roof structures.**~~ Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.5. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet above the allowable *building height* if of combustible materials (see Chapter 15 for additional requirements).
506.1 General. The *building areas* limited by Table 503 shall be permitted to be increased due to frontage *(If)* and *automatic sprinkler system* protection *(Is)* in accordance with Equation 5-1: *Aa* = {*At* + [*At* × *If*] + [*At* × *Is*]} **(Equation 5-1)** where: *Aa* = Allowable *building area* per *story* (square feet). *At* = Tabular *building area* per *story* in accordance with Table 503 (square feet). *If* = Area increase factor due to frontage as calculated in accordance with Section 506.2. *Is* = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.	See 506.2.1 Equation 5-1 and 506.2.3 Equation 5-2 **506.2.1 Single occupancy, one-story buildings.** The allowable area of a single occupancy building with no more than one story above grade plane shall be determined in accordance with Equation 5-1: $A_a = A_t + (NS \times I_f)$ **(Equation 5-1)** where: A_a = Allowable area (square feet). A_t = Tabular allowable area factor (NS, S1, or S13R value, as applicable) in accordance with Table 506.2 . NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is

	sprinklered). I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3. **506.2.3 Single occupancy, multi-story buildings.** The allowable area of a single occupancy building with more than one story above grade plane shall be determined in accordance with Equation 5-2: $A_a = [A_t + (NS \times I_f)] \times S_a$ **(Equation 5-2)** where: A_a = Allowable area (square feet). A_t = Tabular allowable area factor (NS, S13R, or SM value, as applicable) in accordance with Table 506.2. NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is sprinklered). I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3. S_a = Actual number of building stories above grade plane, not to exceed 3. For buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed 4. No individual story shall exceed the allowable area (A_a) as determined by Equations 5-2 using the value of S_a = 1.
506.2 Frontage increase. Every building shall adjoin or have access to a *public way* to receive a *building area* increase for frontage. Where a building has more than 25 percent of its perimeter on a *public way* or open space having a width of not less than 20 feet (6096 mm), the frontage increase shall be determined in accordance with Equation 5-2: *If* = [*F*/*P* - 0.25]*W*/30 **(Equation 5-2)** where: *If* = Area increase due to frontage. *F* = Building perimeter that fronts on a *public way* or open space having 20 feet (6096 mm) open minimum width (feet). *P* = Perimeter of entire building (feet). *W* = Width of *public way* or open space (feet) in accordance with Section 506.2.1.	**506.3.3 Amount of increase.** The area factor increase based on increase shall be determined in accordance with the following: I_f = [*F*/*P* - 0.25]*W*/30 **(Equation 5-4)** where: I_f = Area factor increase due to frontage. *F* = Building perimeter that fronts on a *public way* or open space having minimum ~~dimension~~ distance of 20 feet (6096 mm). *P*= Perimeter of entire building (feet) *W* = Width of *public way* or open space (feet) in accordance with Section ~~506.2.1~~ 506.3.2.
506.2.1 Width limits. To apply this section the value of *W* shall be not less than 20 feet (6096 mm). Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average calculated in accordance with Equation 5-3 for portions of the exterior perimeter walls where the value of *W* is greater than or equal to 20 feet (6096 mm). Where the value of *W* is greater than 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space. *W* shall be measured perpendicular from the face of the building to the closest interior *lot line*. Where the building fronts on a *public way*, the entire width of the *public way* shall be used. Where two or more buildings are on the same *lot*, *W* shall be measured from the exterior face of a each building to the opposing exterior face of each adjacent building, as applicable. Weighted average *W* = (*L1* □□*w*1 + *L*2 *w*2 + *L*3 □□*w*3…)/*F*. **(Equation 5-3)** where: *Ln* = Length of a portion of the exterior perimeter wall. *wn* = Width of open space associated with that portion of the exterior perimeter wall. *F* = Building perimeter that fronts on a *public way* or open space having a width of 20 feet (6096 mm) or more.	~~**506.2.1 Width limits**~~ **506.3.2 Minimum frontage distance.** To ~~apply this section the value of W shall not be less than 20 feet.~~ quality for an area factor increase based on frontage, the *public way* or open space adjacent to the building perimeter shall have a minimum distance (W) of 20 feet (6096 mm) measured at right angles from the building face to any of the following: 1. The closest interior lot line. 2. the entire width a street, alley or *public way.* *3. to the exterior face of an adjacent building on the same property.* ~~Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-4 shall be based on the weighted average calculated in accordance with Equation 5-3 for portions of the exterior perimeter walls where the value of *W* is equal to or greater than 20 feet (6096 mm).~~ Where the value of *W* is greater than 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the building area increase based on frontage ~~weighted average~~, regardless of the actual width of the *public way* or open space. ~~*W* shall be measured perpendicular from the face of the building to the closest interior *lot line*. Where the building fronts on a *public way*, the entire width of the *public way* shall be used. Where two or more buildings are on the same lot, W shall be measured from the exterior face of the building to the exterior face of an opposing building, as applicable..~~ Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance

	with Equation 5-4 shall be based on the weighted average calculated in accordance with Equation 5-3. ~~Weighted average~~ $W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \ldots)/F$. **(Equation 5-3)** where: *W* (Width: weighted average) = Calculated width of public way or open space (feet) L_n = Length of a portion of the exterior perimeter wall. w_n = Width (≥ 20 feet) of a *public way* or open space associated with that portion of the exterior perimeter wall. *F* = Building perimeter that fronts on a *public way* or open space having a width of 20 feet (6096 mm) or more.
506.2.1 **Exception:** Where the building meets the requirements of Section 507, as applicable, except for compliance with the 60-foot (18 288 mm) *public way* or *yard* requirement, and the value of *W* is greater than 30 feet (9144 mm), the value of *W* divided by 30 shall be limited to a maximum of 2.	506.3.2 Exception: Where the building meets the requirements of Section 507, as applicable, except for compliance with the minimum 60-foot (18 288 mm) *public way* or *yard* requirement, and the value of *W* is greater than 30 feet (9144 mm), the value of *W* shall not exceed 60 feet (18 288 mm) ~~*W* divided by 30 shall be limited to a maximum of 2~~.
506.2.2 Open space limits. Such open space shall be either on the same *lot* or dedicated for public use and shall be accessed from a street or *approved fire lane*.	506.3.1 (Last sentence in paragraph. No change to text wording.)
506.3 Automatic sprinkler system increase. Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the *building area* limitation in Table 503 is permitted to be increased by an additional 200 percent (*I*s = 2) for buildings with more than one *story above grade plane* and an additional 300 percent (*I*s = 3) for buildings with no more than one *story above grade plane*. These increases are permitted in addition to the height and *story* increases in accordance with Section 504.2.	Built into Table 506.2 in the rows for S1 and SM for each occupancy
506.3 **Exception 1:** The use of an *automatic sprinkler system* to increase the building area limitation shall not be permitted for the following conditions: 1. Buildings classified as a Group H-1 occupancy.	Built into Table 506.2 in the rows for S1 and SM for H-1 occupancy
506.3 **Exception 2:** The use of an *automatic sprinkler system* to increase the building area limitation shall not be permitted for the following conditions: 2. Buildings, or portions of buildings, classified as either a Group H-2 or H-3 occupancy. For buildings containing such occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.	506.2.2.1 and 506.2.4.1: **Group H-2 or H-3 mixed occupancies.** ~~Buildings, or portions of buildings, classified as either a Group H-2 or H-3 occupancy~~ For a buildings containing Group H-2 or H-3 occupancies, the allowable building area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
506.3 **Exception 3:** The use of an *automatic sprinkler system* to increase the building area limitation shall not be permitted for the following conditions: 3. Buildings where an *automatic sprinkler system* is substituted for fire-resistance rated construction in accordance with Table 601, Note d.	**506.1.3 Fire-resistance rating substitution.** Where sprinklers are substituted for one hour construction in accordance with Table 601, Footnote d, the floor area of the building shall be determined based on the provisions applicable to buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
506.4 Single occupancy buildings with more than one story. The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined in accordance with this section. The actual aggregate *building area* at all *stories* in the building shall not exceed the total allowable *building area*.	**506.2.3 Single occupancy, multi-story buildings.** The allowable area of a single occupancy building with more than one story above grade plane shall be determined in accordance with Equation 5-2: $A_a = [A_t + (NS \times I_f)] \times S_a$ **(Equation 5-2)** where: A_a = Allowable area (square feet). A_t = Tabular allowable area factor (NS, S13R, or SM value, as applicable) in accordance with Table 506.2. NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is

	sprinklered). I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3. S_a = Actual number of building stories above grade plane, not to exceed 3. For buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed 4. No individual story shall exceed the maximum building floor area (A_a) as determined by Equations 5-2 using the value of S_a = 1.
506.4 **Exception:** A single *basement* need not be included in the total allowable *building area*, provided such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*.	**506.1.4 Basements.** ~~A~~ Single story basement~~s~~ need not be included in the total allowable floor area of a building provided ~~such basement~~ the total basement floor area does not exceed ~~the area~~ that permitted for a one-story building ~~with no more than one story above grade plane~~.
506.4.1 Area determination. The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined by multiplying the allowable *building area* per *story* (*Aa*), as determined in Section 506.1, by the number of *stories above grade plane* as listed below: 1. For buildings with two *stories above grade plane*, multiply by 2; 2. For buildings with three or more *stories above grade plane*, multiply by 3; and 3. No *story* shall exceed the allowable *building area* per *story* (*Aa*), as determined in Section 506.1, for the occupancies on that *story*.	**506.2 Allowable area determination.** The allowable area of a building shall be determined in accordance with the applicable provisions of Sections 506.2.1 through 506.2.4 and Section 506.3. **506.2.1 Single occupancy, one-story buildings.** The allowable area of a single occupancy building with no more than one story above grade plane shall be determined in accordance with Equation 5-1: $A_a = A_t + (NS \times I_f)$ **(Equation 5-1)** where: A_a = Allowable area (square feet). A_t = Tabular allowable area factor (NS, S1, or S13R value, as applicable) in accordance with Table 506.2 . NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is sprinklered). I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3. **506.2.3 Single occupancy, multi-story buildings.** The maximum floor area of a single occupancy building with more than one story above grade plane shall be determined in accordance with Equation 5-2: $A_a = [A_t + (NS \times I_f)] \times S_a$ **(Equation 5-2)** where: A_a = Allowable area (square feet). A_t = Tabular allowable area factor (NS, S13R, or SM value, as applicable) in accordance with Table 506.2. NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is sprinklered). I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3. S_a = Actual number of building stories above grade plane, not to exceed 3. For buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed 4. No individual story shall exceed the maximum building floor area (A_a) as determined by Equations 5-2 using the value of S_a = 1.
506.4.1 Exception #1: 1. Unlimited area buildings in accordance with Section 507.	~~506.4.1 Exception #1~~ **506.1.1 Unlimited area buildings.** Unlimited area buildings shall be designed in accordance with Section 507.
506.4.1 Exception #2: 2. The maximum area of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.2 shall be determined by	506.2.3 (S_a value): S_a = Actual number of building stories above grade plane, not to exceed 3. For buildings equipped throughout

multiplying the allowable area per *story (Aa),* as determined in Section 506.1, by the number of *stories above grade plane*.	with an automatic sprinkler system installed in accordance with Section 903.3.1.2, use the actual number of building stories above grade plane, not to exceed 4
506.5 Mixed occupancy area determination. The total allowable *building area* for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single *basement* need not be included in the total allowable *building area*, provided such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*.	~~**506.5 Mixed occupancy area determination.** The total allowable *building area* for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section.~~ **506.1.4 Basements.** ~~A~~ Single story basement~~s~~ need not be included in the total allowable floor area of a building provided ~~such basement~~ the total basement floor area does not exceed ~~the area~~ that permitted for a one-story building ~~with no more than one story above grade plane~~.
506.5.1 No more than one story above grade plane. For buildings with no more than one *story above grade plane* and containing mixed occupancies, the total *building area* shall be determined in accordance with the applicable provisions of Section 508.1.	**506.2.2** ~~**No more than one story above grade plane.**~~ **Mixed occupancy, one-story buildings.** ~~For buildings with no more than one *story above grade plane* and containing mixed occupancies, the total *building area*~~ The maximum floor area of a mixed occupancy building with no more than one story above grade plane shall be determined in accordance with the applicable provisions of Section 508.1.
506.5.2 More than one story above grade plane. For buildings with more than one *story above grade plane* and containing mixed occupancies, each *story* shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three *stories above grade plane*, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* based on the applicable provisions of Section 508.1 shall not exceed 3.	~~**506.5.2**~~ **506.2.4** ~~**More than one story above grade plane.**~~ **Mixed occupancy, multi-story buildings.** ~~For buildings with more than one *story above grade plane* and containing mixed occupancies, each *story*~~ Each story of a mixed occupancy building with more than one story above grade plane shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed 3.
	2015 Proposed Correlating Code Changes to Sections that refer back to Chapter 5
406.6.1 Heights and areas. Enclosed vehicle parking garages and portions thereof that do not meet the definition of *open parking garages* shall be limited to the allowable heights and areas specified in Table 503 as modified by Sections 504, 506 and 507. Roof parking is permitted.	**406.6.1 Heights and areas.** Enclosed vehicle parking garages and portions thereof that do not meet the definition of open parking garages shall be limited to the allowable heights, number of stories and areas specified in ~~Table 503~~ Sections 504 and 506 as modified by Section~~s 504, 506 and~~ 507. Roof parking is permitted.
[F] 415.8.1.1 Type of construction and height exceptions. Buildings shall be constructed in compliance with the height and area limitations of Table 503 for Group H-2; except that where erected of Type I or II construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type IV construction, the maximum *building height* shall be 65 feet (19 812 mm) and except further that, in isolated areas, the maximum *building height* of Type IV structures shall be increased to 85 feet (25 908 mm).	**[F] 415.8.1.1 Type of construction and height exceptions.** Buildings shall be constructed in compliance with the height, number of stories and area limitations ~~of Table 503~~ specified in Sections 504 and 506 for Group H-2 occupancies; except that where erected of Type I or II construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type IV construction, the maximum height shall be 65 feet (19 812 mm) and except further that, in isolated areas, the maximum height of Type IV structures shall be increased to 85 feet (25 908 mm).
[F] 415.8.2.1.1 Height exception. Where storage tanks are located within a building no more than one *story above grade plane*, the height limitation of Section 503 shall not apply for Group H.	**[F] 415.8.2.1.1 Height exception.** Where storage tanks are located within a building no more than one *story above grade plane*, the height limitation of Section ~~503~~ 504 shall not apply for Group H.
507.8 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited areas buildings containing Group F and S occupancies, in accordance with Sections 507.3 and 507.4 and the provisions of Sections 507.8.1 through 507.8.4.	**507.8 Group H-2, H-3 and H-4 occupancies.** Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited areas buildings containing Group F and S occupancies, in accordance with Sections 507.3 and 507.4 and the provisions of Sections 507.8.1 through 507.8.4.
507.8.1 Allowable area. The aggregate floor area of Group H occupancies located in an unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Table 503 as modified by Section 506.2 based upon the perimeter of each Group H floor area that fronts on a *public way* or open space.	**507.8.1 Allowable area.** The aggregate floor area of Group H occupancies located in an unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in ~~Table 503 as modified by Section 506.2~~ Section 506 based upon the perimeter of each Group H floor area that fronts on a public way or open space.
507.8.1.1 Located within the building. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations	**507.8.1.1 Located within the building.** The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations for the

for the Group H occupancies as specified in Table 503.	Group H occupancies as specified in ~~Table 503~~ *Section 506*.
507.8.4 Height limitations. For two-*story* unlimited area buildings, Group H occupancies shall not be located more than one *story above grade plane* unless permitted based on the allowable height in *stories* and feet as set forth in Table 503 for the type of construction of the unlimited area building.	**507.8.4. Height limitations.** For two-story unlimited area buildings, Group H occupancies shall not be located more than one story above grade plane unless permitted based on the allowable height ~~in~~ and number of stories ~~as set forth~~ specified in ~~Table 503~~ Section 504 ~~for~~ based on the type of construction of the unlimited area building.
508.2.1 Area limitations. Aggregate accessory occupancies shall not occupy more than 10 percent of the *building area* of the *story* in which they are located and shall not exceed the tabular values in Table 503, without *building area* increases in accordance with Section 506 for such accessory occupancies.	~~**508.2.1**~~ **508.2.3** ~~**Area limitations.**~~ **Allowable building area.** The allowable floor area of the building shall be based on the applicable provisions of Section 506 for the main occupancy of the building. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the story in which they are located and shall not exceed the tabular values ~~in~~ ~~Table 503~~ for nonsprinklered buildings in Table 506.2 for such accessory occupancies.
508.2.2 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.	~~**508.2.2**~~ **508.2.1 Occupancy classification.** Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space. (No changes to text)
508.2.3 Allowable building area and height. The allowable *building area and height* of the building shall be based on the allowable *building area and height* for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1.	~~**508.2.3**~~ **508.2.2 Allowable building ~~area and~~ height.** The allowable ~~*building area and*~~ height and number of stories of the building shall be ~~based on the allowable building area and height~~ in accordance with Section 504 for the main occupancy of the building ~~in accordance with Section 503.1~~. The allowable height ~~of~~ for each accessory occupancy shall not exceed the tabular values in Table ~~503~~ 504.3 and Table 504.4 ~~without increases in accordance with Section 504~~ for nonsprinklered buildings specified for each such accessory occupancy. ~~The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1~~.
510.2(7) The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*.	510.2(7) The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section ~~503~~ 504.3 for the building having the smaller allowable height as measured from the *grade plane*.
3102.4 Allowable floor areas. The area of a membrane structure shall not exceed the limitations set forth in Table 503, except as provided in Section 506.	**3102.4 Allowable floor areas.** The area of a membrane structure shall not exceed the floor area limitations ~~set forth in Table 503, except as provided~~ specified in Section 506.
3102.5 Maximum height. Membrane structures shall not exceed one *story* nor shall such structures exceed the height limitations in feet set forth in Table 503. **Exception:** Noncombustible membrane structures serving as roofs only.	**3102.5 Maximum height and number of stories.** Membrane structures shall not exceed one story nor shall such structures exceed the height limitations in feet ~~set forth~~ specified in ~~Table 503~~ Section 504.3. **Exception**: Noncombustible membrane structures serving as roofs only.
3412.6.1 (IEBC 1301.6.1) Building height. The value for building height shall be the lesser value determined by the formula in Section 3412.6.1.1. Chapter 5 shall be used to determine the allowable height of the building, including allowable increases due to automatic sprinklers as provided for in Section 504.2. Subtract the actual *building height* in feet from the allowable and divide by 12 1/2 feet. Enter the height value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.1, Building Height, for fire safety, means of egress and general safety. The maximum score for a building shall be 10.	**3412.6.1 Building height and number of stories. (and in the IEBC [B] 1301.6.1 Building height).** The value for building height and number of stories shall be the lesser value determined by the formula in Section 3412.6.1.1. ~~Chapter 5~~ Section 504 shall be used to determine the allowable height and number of stories of the building~~, including allowable increases due to automatic sprinklers as provided for in Section 504.2~~. Subtract the actual building height in feet from the allowable and divide by 12 1/2 feet. Enter the height value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.1, Building Height, for fire safety, means of egress and general safety. The maximum score for a building shall be 10.
3412.6.1.1 (IEBC 1301.6.1.1) 3412.6.1.1 Height formula. The following formulas shall be used in computing the building height value. $\text{Height value, feet} = \frac{(AH)-(EBH)}{12.5} \times CF$ **(Equation 34-1)** $\text{Height value, feet} = (AS - EBS) \times CF$ **(Equation 34-2)**	**3412.6.1.1 Height formula. (and in the IEBC [B] 1301.6.1.1 Height formula.)** The following formulas shall be used in computing the building height value.

where: *AH* = Allowable height in feet from Table 503. *EBH* = Existing *building height* in feet. *AS* = Allowable height in stories from Table 503. *EBS* = Existing building height in stories. *CF* = 1 if (*AH*) – (*EBH*) is positive. *CF* = Construction-type factor shown in Table 3412.6.6(2) if (*AH*) – (*EBH*) is negative. **Note:** Where mixed occupancies are separated and individually evaluated as indicated in Section 3412.6, the values AH, AS, EBH and EBS shall be based on the height of the occupancy being evaluated.	$\text{Height value, feet} = \frac{(AH)-(EBH)}{12.5}\times CF$ **(Equation 34-1)** $\text{Height value, feet} = (AS - EBS)\times CF$ **(Equation 34-2)** where: AH = Allowable height in feet from ~~Table 503~~ Section 504. EBH = Existing building height in feet. AS = Allowable number of stories from ~~Table 503~~ Section 504. EBS = Existing building number of stories. CF = 1 if (AH) – (EBH) is positive. CF = Construction-type factor shown in Table 3412.6.6(2) if (AH) – (EBH) is negative. **Note:** Where mixed occupancies are separated and individually evaluated as indicated in Section 3412.6, the values AH, AS, EBH and EBS shall be based on the height of the occupancy being evaluated.
3412.6.2 (IEBC 1301.6.2) Building area. The value for building area shall be determined by the formula in Section 3412.6.2.2. Section 503 and the formula in Section 3412.6.2.1 shall be used to determine the allowable area of the building. This shall include any allowable increases due to frontage and automatic sprinklers as provided for in Section 506. Subtract the actual *building area* in square feet from the allowable area and divide by 1,200 square feet. Enter the area value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.2, Building Area, for fire safety, means of egress and general safety. In determining the area value, the maximum permitted positive value for area is 50 percent of the fire safety score as *listed* in Table 3412.8, Mandatory Safety Scores.	**3412.6.2 Building area. (and in the IEBC [B] 1301.6.2 Building area.)** The value for building area shall be determined by the formula in Section 3412.6.2.2. Section ~~503~~ 506 and the formula in Section 3412.6.2.1 shall be used to determine the allowable area of the building. ~~This shall include any allowable increases due to frontage and automatic sprinklers as provided for in Section 506.~~ Subtract the actual building area in square feet from the allowable area and divide by 1,200 square feet. Enter the area value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.2, Building Area, for fire safety, means of egress and general safety. In determining the area value, the maximum permitted positive value for area is 50 percent of the fire safety score as listed in Table 3412.8, Mandatory Safety Scores.
3412.6.2.1 (IEBC 1301.6.2.1) Allowable area formula. The following formula shall be used in computing allowable area: *Aa* = {*At* + [*At* x *If*] + [*At* x *Is*]} **(Equation 34-3)** where: *Aa* = Allowable *building area* per story (square feet). *At* = Tabular *building area* per story in accordance with Table 503 (square feet). *Is* = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3. *If* = Area increase factor due to for frontage as calculated in accordance with Section 506.2.	**3412.6.2.1 Allowable area formula. (and in the IEBC [B] 1301.6.2.1 Allowable area formula.)** The following formula shall be used in computing allowable area: ~~*Aa* = {*At* + [*At* x *If*] + [*At* x *Is*]} **(Equation 34-3)**~~ $A_a = A_t + (NS \times I_f)$ **(Equation 34-3)** where: A_a = Allowable building area per story (square feet). A_t = Tabular ~~building~~ allowable area ~~per story~~ factor (NS, S1, S13R, or SM value, as applicable) in accordance with Table ~~503~~ 506.2 ~~(square feet)~~. NS = Tabular allowable area factor in accordance with Table 506.2 for non-sprinklered building (regardless of whether or not the building is sprinklered). ~~I_s = Area increase due to sprinkler protection as calculated in accordance with Section 506.3.~~ I_f = Area factor increase ~~factor~~ due to ~~for~~ frontage as calculated in accordance with Section ~~506.2~~ 506.3.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: None

G101-12

Public Hearing: Committee: AS AM D

G102 – 12

503, 503.1, Table 503.1, 506, 507, 508, 509.1, 909.2, 590.3, 509.7

Proponent: David S. Collins, The Preview Group, Inc. (dcollins@preview-group.com)

Revise as follows:

SECTION 503
GENERAL BUILDING HEIGHT
~~AND AREA LIMITATIONS~~

503.1 General. The *building height ~~and area~~* shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

TABLE 503
ALLOWABLE BUILDING HEIGHTS ~~AND AREAS~~[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		Type I		Type II		Type III		Type IV	Type V	
~~GROUP~~	HEIGHT	A	B	A	B	A	B	HT	A	B
	(feet)	UL	160	65	55	65	55	65	50	40
	~~STORIES(S)~~ ~~AREA (A)~~									
~~A-1~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~5~~ ~~UL~~	~~3~~ ~~15,500~~	~~2~~ ~~8,500~~	~~3~~ ~~14,000~~	~~2~~ ~~8,500~~	~~3~~ ~~15,000~~	~~2~~ ~~11,500~~	~~1~~ ~~5,500~~
~~A-2~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~11~~ ~~UL~~	~~3~~ ~~15,500~~	~~2~~ ~~9,500~~	~~3~~ ~~14,000~~	~~2~~ ~~9,500~~	~~3~~ ~~15,000~~	~~2~~ ~~11,500~~	~~1~~ ~~6,000~~
~~A-3~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~11~~ ~~UL~~	~~3~~ ~~15,500~~	~~2~~ ~~9,500~~	~~3~~ ~~14,000~~	~~2~~ ~~9,500~~	~~3~~ ~~15,000~~	~~2~~ ~~11,500~~	~~1~~ ~~6,000~~
~~A-4~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~11~~ ~~UL~~	~~3~~ ~~15,500~~	~~2~~ ~~9,500~~	~~3~~ ~~14,000~~	~~2~~ ~~9,500~~	~~3~~ ~~15,000~~	~~2~~ ~~11,500~~	~~1~~ ~~6,000~~
~~A-5~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~	~~UL~~ ~~UL~~
~~B~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~11~~ ~~UL~~	~~5~~ ~~37,500~~	~~3~~ ~~23,000~~	~~5~~ ~~28,500~~	~~3~~ ~~19,000~~	~~5~~ ~~36,000~~	~~3~~ ~~18,000~~	~~2~~ ~~9,000~~
~~E~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~5~~ ~~UL~~	~~3~~ ~~26,500~~	~~2~~ ~~14,500~~	~~3~~ ~~23,500~~	~~2~~ ~~14,500~~	~~3~~ ~~25,500~~	~~1~~ ~~18,500~~	~~1~~ ~~9,500~~
~~F-1~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~11~~ ~~UL~~	~~4~~ ~~25,000~~	~~2~~ ~~15,500~~	~~3~~ ~~19,000~~	~~2~~ ~~12,000~~	~~4~~ ~~33,500~~	~~2~~ ~~14,000~~	~~1~~ ~~8,500~~
~~F-2~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~11~~ ~~UL~~	~~5~~ ~~37,500~~	~~3~~ ~~23,000~~	~~4~~ ~~28,500~~	~~3~~ ~~18,000~~	~~5~~ ~~50,500~~	~~3~~ ~~21,000~~	~~2~~ ~~13,000~~
~~H-1~~	~~S~~ ~~A~~	~~1~~ ~~21,000~~	~~1~~ ~~16,500~~	~~1~~ ~~11,000~~	~~1~~ ~~7,000~~	~~1~~ ~~9,500~~	~~1~~ ~~7,000~~	~~1~~ ~~10,500~~	~~1~~ ~~7,500~~	~~NP~~ ~~NP~~
~~H-2~~	~~S~~ ~~A~~	~~UL~~ ~~21,000~~	~~3~~ ~~16,500~~	~~2~~ ~~11,000~~	~~1~~ ~~7,000~~	~~2~~ ~~9,500~~	~~1~~ ~~7,000~~	~~2~~ ~~10,500~~	~~1~~ ~~7,500~~	~~1~~ ~~3,000~~
~~H-3~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~6~~ ~~60,000~~	~~4~~ ~~26,500~~	~~2~~ ~~14,000~~	~~4~~ ~~17,500~~	~~2~~ ~~13,000~~	~~4~~ ~~25,500~~	~~2~~ ~~10,000~~	~~1~~ ~~5,000~~
~~H-4~~	~~S~~ ~~A~~	~~UL~~ ~~UL~~	~~7~~ ~~UL~~	~~5~~ ~~37,500~~	~~3~~ ~~17,500~~	~~5~~ ~~28,500~~	~~3~~ ~~17,500~~	~~5~~ ~~36,000~~	~~3~~ ~~18,000~~	~~2~~ ~~6,500~~
~~H-5~~	~~S~~	4	4	~~3~~	~~3~~	~~3~~	~~3~~	~~3~~	~~3~~	~~2~~

	~~A~~	~~UL~~	~~UL~~	~~37,500~~	~~23,000~~	~~28,500~~	~~19,000~~	~~36,000~~	~~18,000~~	~~9,000~~
~~I-1~~	~~S~~	~~UL~~	~~9~~	~~4~~	~~3~~	~~4~~	~~3~~	~~4~~	~~3~~	~~2~~
	~~A~~	~~UL~~	~~55,000~~	~~19,000~~	~~10,000~~	~~16,500~~	~~10,000~~	~~18,000~~	~~10,500~~	~~4,500~~
~~I-2~~	~~S~~	~~UL~~	~~4~~	~~2~~	~~1~~	~~1~~	~~NP~~	~~1~~	~~1~~	~~NP~~
	~~A~~	~~UL~~	~~UL~~	~~15,000~~	~~11,000~~	~~12,000~~	~~NP~~	~~12,000~~	~~9,500~~	~~NP~~
~~I-3~~	~~S~~	~~UL~~	~~4~~	~~2~~	~~1~~	~~2~~	~~1~~	~~2~~	~~2~~	~~1~~
	~~A~~	~~UL~~	~~UL~~	~~15,000~~	~~10,000~~	~~10,500~~	~~7,500~~	~~12,000~~	~~7,500~~	~~5,000~~
~~I-4~~	~~S~~	~~UL~~	~~5~~	~~3~~	~~2~~	~~3~~	~~2~~	~~3~~	~~1~~	~~1~~
	~~A~~	~~UL~~	~~60,500~~	~~26,500~~	~~13,000~~	~~23,500~~	~~13,000~~	~~25,500~~	~~18,500~~	~~9,000~~
~~M~~	~~S~~	~~UL~~	~~11~~	~~4~~	~~2~~	~~4~~	~~2~~	~~4~~	~~3~~	~~1~~
	~~A~~	~~UL~~	~~UL~~	~~21,500~~	~~12,500~~	~~18,500~~	~~12,500~~	~~20,500~~	~~14,000~~	~~9,000~~
~~R-1~~	~~S~~	~~UL~~	~~11~~	~~4~~	~~4~~	~~4~~	~~4~~	~~4~~	~~3~~	~~2~~
	~~A~~	~~UL~~	~~UL~~	~~24,000~~	~~16,000~~	~~24,000~~	~~16,000~~	~~20,500~~	~~12,000~~	~~7,000~~
~~R-2~~	~~S~~	~~UL~~	~~11~~	~~4~~	~~4~~	~~4~~	~~4~~	~~4~~	~~3~~	~~2~~
	~~A~~	~~UL~~	~~UL~~	~~24,000~~	~~16,000~~	~~24,000~~	~~16,000~~	~~20,500~~	~~12,000~~	~~7,000~~
~~R-3~~	~~S~~	~~UL~~	~~11~~	~~4~~	~~4~~	~~4~~	~~4~~	~~4~~	~~3~~	~~3~~
	~~A~~	~~UL~~	~~UL~~	~~UL~~	~~UL~~	~~UL~~	~~UL~~	~~UL~~	~~UL~~	~~UL~~
~~R-4~~	~~S~~	~~UL~~	~~11~~	~~4~~	~~4~~	~~4~~	~~4~~	~~4~~	~~3~~	~~2~~
	~~A~~	~~UL~~	~~UL~~	~~24,000~~	~~16,000~~	~~24,000~~	~~16,000~~	~~20,500~~	~~12,000~~	~~7,000~~
~~S-1~~	~~S~~	~~UL~~	~~11~~	~~4~~	~~2~~	~~3~~	~~2~~	~~4~~	~~3~~	~~1~~
	~~A~~	~~UL~~	~~48,000~~	~~26,000~~	~~17,500~~	~~26,000~~	~~17,500~~	~~25,500~~	~~14,000~~	~~9,000~~
~~S-2~~	~~S~~	~~UL~~	~~11~~	~~5~~	~~3~~	~~4~~	~~3~~	~~5~~	~~4~~	~~2~~
	~~A~~	~~UL~~	~~79,000~~	~~39,000~~	~~26,000~~	~~39,000~~	~~26,000~~	~~38,500~~	~~21,000~~	~~13,500~~
~~U~~	~~S~~	~~UL~~	~~5~~	~~4~~	~~2~~	~~3~~	~~2~~	~~4~~	~~2~~	~~1~~
	~~A~~	~~UL~~	~~35,500~~	~~19,000~~	~~8,500~~	~~14,000~~	~~8,500~~	~~18,000~~	~~9,000~~	~~5,500~~

For SI: 1 foot = 304.8 mm~~, 1 square foot = 0.0929~~ ~~m^2~~.

~~A = building area per story, S = stories above grade plane,~~ UL = Unlimited~~, NP = Not permitted.~~

a. See the following sections for general exceptions to Table 503:
   1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
   2. ~~Section 506.2, Allowable building area increase due to street frontage.~~
   3. ~~Section 506.3, Allowable building area increase due to automatic sprinkler system installation.~~
   4. ~~Section 507, Unlimited area buildings.~~

b. See Chapter 4 for specific exceptions to the allowable height and areas in Chapter 5.

Delete the following sections in their entirety without substitution.

~~SECTION 506~~
~~BUILDING AREA MODIFICATIONS~~

~~SECTION 507~~
~~UNLIMITED AREA BUILDINGS~~

~~SECTION 508~~
~~MIXED USE AND OCCUPANCY~~

Revise as follows:

SECTION ~~509~~ <u>506</u>
INCIDENTAL USES

(Portions of text not shown remain unchanged other than re-numbering)

SECTION ~~510~~ <u>507</u>
SPECIAL PROVISIONS

~~510.1~~ **507.1 General.** The provisions in Sections ~~510.2~~ 507.2 through ~~510.9~~ 507.9 shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable *building heights* ~~*and areas*~~ of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in this section for such condition and other applicable requirements of this code. The provisions of Sections ~~510.2~~ 507.2 through ~~510.8~~ 507.8 are to be considered independent and separate from each other.

~~**510.2 Horizontal building separation allowance**. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:~~

1. ~~The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours.~~
2. ~~The building below the *horizontal assembly* is not greater than one *story above grade plane*.~~
3. ~~The building below the *horizontal assembly* is of Type IA construction.~~
4. ~~*Shaft*, *stairway*, *ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.5.~~

   ~~**Exception:** Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fireresistance rating* with opening protectives in accordance with Section 716.5, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided:~~
   1. ~~The building above the *horizontal assembly* is not required to be of Type I construction;~~
   2. ~~The enclosure connects fewer than four *stories*; and~~
   3. ~~The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.~~
5. ~~The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occu pancy uses, each with an *occupant load* of less 300, or Group B, M, R or S occupancies.~~
6. ~~The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:~~
   - ~~6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;~~
   - ~~6.2. Multiple Group A, each with an *occupant load* of less than 300;~~
   - ~~6.3. Group B;~~
   - ~~6.4. Group M;~~
   - ~~6.5. Group R; and~~
   - ~~6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).~~
7. ~~The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*.~~

~~510.3~~ **507.2 Group S-2 enclosed parking garage with Group S-2 open parking garage above.** A Group S-2 enclosed parking garage with not more than one *story* above *grade plane* and located below a Group S-2 *open parking garage* shall be classified as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

~~1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.~~

~~2~~ 1. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the *fire-resistance* requirements of the Group S-2 *open parking garage*.

~~3~~ 2 The height and the number of tiers of the Group S-2 *open parking garage* shall be limited as specified in Table 406.5.4.

~~4~~ 3 The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 *open parking garage* shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 *open parking garage*, except *exit* openings, shall not be required to be protected.

~~5~~ 4 The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m^2), and mechanical equipment rooms incidental to the operation of the building.

~~510.7~~ 507.6 Open parking garage beneath Groups A, I, B, M and R. *Open parking garages* constructed under Groups A, I, B, M and R shall not exceed the height ~~and area~~ limitations permitted under Section 406.5. The height and area of the portion of the building above the *open parking garage* shall not exceed the limitations in Section 503 for the upper occupancy. The height, in both feet and *stories*, of the portion of the building above the *open parking garage* shall be measured from *grade plane* and shall include both the *open parking garage* and the portion of the building above the parking garage.

Reason: A study group of the ICC's Codes Technology Committee worked for almost four years to examine the rationale and background for the criteria within Table 503 and to determine what needed to be corrected. The study group examined the origins of the table and the procedure used to develop it. No rational basis was identified or established for any of the values within the table. Nothing exists that correlates the performance of a building by construction type and occupancy to fire performance, life safety or property damage. NFPA's latest analysis of the available data indicates that social conditions are far more predictable of likely loss.

Codes limit the arrangement of building areas by several limitations. Means of egress travel distance limits the exposure of the building occupants, the requirements of stairs to discharge to the outside, distance of standpipes and even Appendix B in the IFC, all limit the configuration of a building. Area limits in Table 503 affect little except to provide market share for materials interests.

Cost Impact: This code change proposal will not increase the cost of construction.

G102-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

503-G-COLLINS

G103 – 12
503.1, 706.1

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

503.1 General. The *building height and area* shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. <u>For the purposes of determining area limitations, height limitations and type of construction</u>, each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

Revise as follows:

706.1 General. <u>For the purposes of determining area limitations, height limitations and type of construction,</u> each portion of a building separated by one or more *fire walls* that comply with the provisions of this section shall be considered a separate building. The extent and location of such *fire walls* shall provide a complete separation. Where a *fire wall* also separates occupancies that are required to be separated by a *fire barrier* wall, the most restrictive requirements of each separation shall apply.

Reason: Consistency and coordination among the International Codes is one of the cornerstones of the ICC Code Development process. The ICC Board established the ICC Building Code Action Committee (BCAC) to act as a forum to deal with complex issues ahead of the Code Development Process, identify emerging issues and draft proposed code changes.
This proposed change is a result of the BCAC's work.

Clarifies the intent of the these sections of the Code that the requirement for a fire wall in Sections 503.1 and 706.1 is predicated on the determination of the maximum allowable height and area calculations under Chapter 5. Using these sections of Code to control other building features or elements such as means of egress, building systems or building utilities is not intended or implied by these sections of the Code. There are no requirements in the I Codes that mandate that the placement of fire walls create a separate building such that its building features need to be separated from other like building features in adjacent buildings.

Cost Impact: The proposed changes will not increase the cost of construction.

G103-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

503.1-G-BAJNAI-BCAC

G104 – 12
503.1

Proponent: Gene Boecker, Code Consultants, Inc., representing self

Revise as follows:

503.1 General. ~~The~~ Unless otherwise specifically modified in Chapter 4, *building height and area* shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

Reason: Section 503.1 needs to include this provision to make it clear that Chapter 4 also contains height and area requirements which may be more or less restrictive than those in Chapter 5. The problem is that except as a footnote to Table 503, no reference is made in the code to the fact that Chapter 4 contains specific language that modifies the allowable heights and areas for various structures based on their unique conditions. This occurs in 402.4, 403.2, 405.2, 406.5.1, 406.5.5, 406.7.2, 410.3.1, 410.3.2, 410.4, 412.3.1, 412.4.2, 412.4.6, 412.6.2, 415.8.1.1, 415.8.1.6.

Numerous sections of the IBC as well as other codes in the ICC family refer back to the limiting the height and area based on the requirements in Chapter 5 of the IBC. Without this reference, these other sections in Chapter 4 are not tied in; and, the IBC itself is more complete. For example, the IEBC refers to allowing building height and area based on the Chapter 5 but makes no reference to Chapter 4. Essentially, any modification to a covered mall, high-rise building, open parking garage and various High Hazard occupancies could be literally interpreted to require compliance with Table 503, rendering the initial construction noncompliant. This proposal closes a gap in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

G104-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

503.1-E-BOECKER (1).doc

G105 – 12
503.1.1

Proponent: Jerry R. Tepe, FAIA, JRT•AIA Architect, representing American Institute of Architects

Revise as follows:

503.1 General. The *building height and area* shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

503.1.1 Special industrial occupancies. Buildings and structures designed to house special industrial processes that require large areas and unusual *building heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the *building height and area* limitations of Table 503 when approved by the *building official*.

Reason: As an alternative to my proposed change to remove the blanket exemption from area requirements, at a minimum require the approval of the building official rather than an absolute exemption.

Cost Impact: The proposed changes will not increase the cost of construction.

G105-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

503.1.1 #1-G-TEPE

G106 – 12
503.1.1, 504.1

Proponent: Jerry R. Tepe, FAIA, JRT•AIA Architect, representing American Institute of Architects

Revise as follows:

503.1 General. The *building height and area* shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

~~**503.1.1 Special industrial occupancies.** Buildings and structures designed to house special industrial processes that require large areas and unusual *building heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the *building height and area* limitations of Table 503.~~

504.1 General. The *building height* permitted by Table 503 shall be increased in accordance with Sections 504.2 and
504.3.

Exception<u>s</u>:

1. <u>1.</u> The *building height* of one-*story* aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an *automatic sprinkler system* or *automatic fire-extinguishing system* in accordance with Chapter 9 and is entirely surrounded by *public ways* or *yards* not less in width than one and one-half times the *building height*.
2. <u>2. Buildings and structures designed to house special industrial processes that require unusual *building heights* to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the *building height* limitations of Table 503 when approved by the *building official*.</u>

Reason: Section 507 already provides for unlimited area buildings and provides the additional safety of at least the 60 foot fire separation distance, so there is no need to give a blanket exemption for area as currently provided in Section 503.1.1. Since area is no longer applicable, relocate the blanket exemption for height to Section 504.

If you examine the listing for Group F-2, it contains almost all the types of occupancies listed in this “special Industrial occupancies” (except electric generation plants, Group F-1). As all of these occupancies are considered as equal in fire safety, why should some be exempt from the additional requirements of Section 507 simply because they might have “special machinery and equipment?” All those listed as Group F-2 only need to provide the 60 foot separation to comply with Section 507.2.

Additionally, the large areas required for these buildings would require a sprinkler system for Group F-1 per Section 903.2.4. Therefore, these buildings can comply with Section 507.3

Finally, require the approval of the building official rather than an absolute exemption.

Cost Impact: The proposed changes will not increase the cost of construction.

G106-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

503.1.1 #2-G-TEPE

G107 – 12
Table 503

Proponent: Homer Maiel, P.E., CBO, Town of Atherton (CA), representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane. Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

Group		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
	STORIES(S) AREA (A)									
R-1[c]	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000
R-2[c]	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m2.
A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.
a. See the following sections for general exceptions to Table 503:
   1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
   2. Section 506.2, Allowable building area increase due to street frontage.
   3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
   4. Section 507, Unlimited area buildings.
b. See Chapter 4 for specific exceptions to the allowable height and areas in Chapter 5.
c. See Sections 510.5 and 510.6 for additional increases in height and number of stories.

Reason: Adding this footnote makes a proper link between this table and Sections 510.5 and 510.6.

Cost Impact: This code change will not increase the cost of construction.

G107-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T503-G-MAIEL

G108 – 12
Table 503

Proponent: Dennis Richardson, P.E., CBO, City of Salinas, Tri-Chapter (Penisula, East Bay and Monterey Chapters, ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a, b]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

Group		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
	STORIES(S) AREA (A)									
R-2	S A	UL UL	11 UL	~~4~~ 5 24,000	4 16,000	4 24,000	4 16,000	4 20,500	~~3~~ 4 12,000	2 7,000

(Portions of table not shown remain unchanged)

Reason: This code change encourages the use of light-frame one hour rated construction for a greater portion of the construction of apartment buildings. Not only is this a sustainable practice reducing greenhouse gas emissions, but by utilizing more light-frame construction for this type of project, costs are reduced making rental housing more viable on difficult urban infill projects. The City of Seattle has utilized a similar code modification for type VA construction for years with excellent safety results. Construction over 4 stories requires the use of an NFPA 13 sprinkler system throughout instead of the NFPA 13R system permitted for projects 4 stories and under. R-2 apartment construction is highly compartmentalized and fully sprinklered one hour construction has an excellent track record. Structural systems and construction methods to allow this type of multi level light frame construction continues to evolve and improve.

Cost Impact: This code change will not increase the cost of construction.

G108-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T503-G-RICHARDSON

G109 – 12
505.2.4 (NEW)

Proponent: Jonathan Siu, City of Seattle Dept of Planning & Development, representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov)

Add new text as follows:

505.2.4 Construction. Mezzanines and their supporting construction shall be of not less than one-hour fire-resistance-rated construction.

Exception: Mezzanines in buildings of Types IIB, IIIB and VB construction shall be permitted to be of unprotected construction, provided the materials used are allowed for the building type of construction.

Reason: The purpose of this code change is to provide clear guidance to the code user as to what is required for mezzanine and equipment platform construction. This is a companion to a code change proposal being submitted by the WABO Technical Code Development Committee relating to construction requirements for equipment platforms (Section 505.3).

The 2012 IBC is silent on the type of construction and fire resistance rating requirements for mezzanines. This can be interpreted to mean that any materials can be used—for example, unprotected wood construction would be allowed in a Type VA or even a Type IA building. This code change proposal seeks to clarify the requirement by requiring 1-hour protected construction for mezzanines, but has an exception for non-rated construction types.

Cost Impact: The code change proposal will increase the cost of construction.

G109-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.2.4 (NEW)-G-SIU

G110 – 12
505.3

Proponent: Jonathan Siu, City of Seattle Department of Planning & Development, representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov)

Revise as follows:

505.3 Equipment platforms. *Equipment platforms* in buildings shall not be considered as a portion of the floor below. Such *equipment platforms* shall not contribute to either the *building area* or the number of *stories* as regulated by Section 503.1. The area of the *equipment platform* shall not be included in determining the *fire area* in accordance with Section 903. *Equipment platforms* shall not be a part of any *mezzanine* and such platforms and the walkways, *stairs*, *alternating tread devices* and ladders providing access to an *equipment platform* shall not serve as a part of the *means of egress* from the building. Equipment platforms and their supporting construction shall be of not less than one-hour fire-resistance-rated construction

Exceptions:

1. Equipment platforms in buildings of Types IIB, IIIB and VB construction are permitted to be of unprotected construction provided the materials used are allowed for the building type of construction.
2. Equipment platforms with no occupied space below are permitted to be of unprotected construction provided the materials used are allowed for the building type of construction.

Reason: The purpose of this code change is to provide clear guidance to the code user as to what is required for equipment platform construction. This is a companion to a code change proposal being submitted by the WABO Technical Code Development Committee relating to construction requirements for mezzanines (Section 505.2).

The 2012 IBC is silent on the type of construction requirements for equipment platforms. This can be interpreted to mean that any materials can be used—for example unprotected wood construction would be allowed in a Type VA or even a Type IA building. This code change proposal seeks to clarify the requirement by requiring 1-hour protected construction for equipment platforms with an exception for non-rated construction types. Where there is no occupied space below a platform (i.e., where the platform is close to the floor), the proposal gives the option of using unprotected construction, as long as the materials used are consistent with the type of construction for the building.

Cost Impact: The code change proposal will increase the cost of construction.

G110-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.3-G-SIU

G111 – 12
506.1.1 (NEW)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

506.1.1 Buildings separated by Fire Walls. In accordance with the definition of *building area*, each building separated by a *fire wall* shall be calculated separately only using the allowable factors of tabular building area, yards and automatic sprinklers as applicable for each separated building. For the frontage increase of Section 506.2, only those yards that each such separated building is in contact with shall be counted and using a zero feet yard for the *fire wall* portion of the F/P calculation.

Each separated building shall be permitted to incorporate accessory uses, incidental uses, non-separated mixed uses and separated mixed uses within its individual considerations.

Reason: While it is clear in the definition of “Area, building” that a building is each portion that is separated by a fire wall, it is not that clear when using the term “building” in the allowable area calculations. The term “building” in all of Section 506 is each independently separated building, not the entire structure. This is explained in the commentary. Yet, individuals are still using yard calculations and mixed use ratio calculations based on the whole structure across fire walls.

The yard along the side with the Fire Wall should be 0’, as though it were built on a property line, not the actual yard on the other side of the remainder of the structure.

What makes it more confusing is that within each individual building, there may be different Accessory, Incidental, non-separated mixed uses and separated mixed uses. This is intended to add clarification.

If not approved, at least the commentary should be made more explanatory.

Cost Impact: This code change proposal will not increase the cost of construction.

G111-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.1.1 (NEW)-G-GODWIN

G112 – 12
506.4, 506.5

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

506.4 Single occupancy buildings with more than one story. The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined in accordance with this section. The actual aggregate *building area* at all *stories* in the building shall not exceed the total allowable *building area*.

> **Exception:** ~~A single *basement*~~ Basements need not be included in the total allowable *building area*, provided the total area of such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*.

506.5 Mixed occupancy area determination. The total allowable *building area* for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. ~~A single *basement*~~ Basements need not be included in the total allowable *building area*, provided the total area of such *basements* does not exceed the area permitted for a building with no more than one *story above grade plane*.

Reason: Intended to be editorial to provide better understanding and clarify the existing provisions on basement area calculations.

If a building has two or more small basements on opposite sides of a building that are ***not*** connected, how does one review such basements under these existing provisions? The existing code says "…A ***single*** basement…".

The BCAC Committee believes the intent of the Code was not to prohibit multiple individual basements under a building as long as they do not exceed the area permitted for a building with no more than one story above grade plane.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: None.

G112-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.4-G-BAJNAI-BCAC

G113 – 12
506.4, 506.5

Proponent: Dennis Richardson, P.E., CBO, City of Salinas, Tri-Chapter (Peninsula, East Bay and Monterey Chapters, ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

506.4 Single occupancy buildings with more than one story. The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined in accordance with this section. The actual aggregate *building area* at all *stories* in the building shall not exceed the total allowable *building area*.

Exceptions:

1. A single *basement* need not be included in the total allowable *building area*, provided such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*.
2. The first floor of a single occupancy building with more than one story above grade plane shall not exceed the area permitted for a building with no more than one story above grade plane provided the actual aggregate building area shall not exceed the total allowable building area.

506.5 Mixed occupancy area determination. The total allowable *building area* for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single *basement* need not be included in the total allowable *building area*, provided such *basement* does not exceed the area permitted for a building with no more than one *story above grade plane*. The first floor of a multiple occupancy building with more than one story above grade plane shall not exceed the area permitted for a building with no more than one story above grade plane provided the actual aggregate building area shall not exceed the total allowable building area determined in accordance with the applicable provisions of this section.

Reason: Because of the step-function of Is by floor in equation 5-1 as described in Section 506.3, the first floor of a two story building is not allowed to be as large as the first floor of a one story building. This creates a problem when the owner wants to add a smaller second story addition to a one story building if the one story building is already at maximum area. This code provision is intended to allow for flexibility in the size of the first floor as long as it does not exceed what would be allowed for a one story building and as long as the total building area in the aggregate of all stories above grade is still compliant with the code requirements.

This code change will also allow architects more latitude to design stepped building (wedding cake) without sacrificing floor area.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: This code change does not increase construction cost.

G113-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.4-G-RICHARDSON

G114 – 12

507.1, 507.1.1 (NEW), 507.1.2 (NEW), 507.2, 507.3, 507.4, 507.5, 507.6, 507.7, 507.8, 507.8.2, 507.9, 507.10, 507.11

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

507.1 General. The area of buildings of the occupancies and configurations specified in this section. ~~Sections 507.1 through 507.12 shall not be limited~~.

~~**Exception:** Other occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2.~~

~~Where Sections 507.2 through 507.12 require buildings to be surrounded and adjoined by *public ways* and *yards*, those open spaces shall be determined as follows:~~

507.1.1 Open space. Unlimited area buildings shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width. The width of these open spaces shall be determined as follows:

1. *Yards* shall be measured from the building perimeter in all directions to the closest interior *lot lines* or to the exterior face of an opposing building located on the same *lot*, as applicable.
2. Where the building fronts on a *public way*, the entire width of the *public way* shall be used.

Exceptions:

1. Group H-2 aircraft paint hangar shall be surrounded and adjoined by *public ways* or *yards* not less in width than one and one-half times the *building height*.
2. The open space shall be permitted to be reduced to not less than 40 feet (12 192 mm) in width for building identified in Sections to 507.2, 507.3, 507.4, 507.6 and 507.11 and provided all of the following requirements are met:
   - 2.1. The reduced width shall not be allowed for more than 75 percent of the perimeter of the building.
   - *2.2.* The exterior walls facing the reduced width shall have a fire-resistance rating of not less than 3 hours.
   - 2.3 Openings in the exterior walls facing the reduced width shall have opening protectives with a fire protection rating of not less than 3 hours.
3. The open space shall be permitted to be reduced for covered and open mall buildings in accordance with Section 402.1.1.

507.1.2 Accessory occupancies. Other occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2. Group H occupancies shall comply with Section 507.1.2

~~507.8~~ 507.2 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F and S occupancies in accordance with Sections 507.3 and 507.4 and the provisions of Sections ~~507.8.1 through 507.8.4.~~ **507.1.3.1 through 507.1.3.4.**

~~507.8.1~~ 507.2.1 Allowable area. *(no change)*

~~507.8.1.1~~ 507.2.1.1 Located within the building. *(no change)*

~~507.8.1.1.1~~ 507.2.1.2 Liquid use, dispensing and mixing rooms. *(no change)*

~~507.8.1.1.2~~ 507.2.1.3 Liquid storage rooms. *(no change)*

~~507.8.1.1.3~~ 507.2.1.4 Spray paint booths. *(no change)*

~~507.8.2~~ 507.2.2 Located on building perimeter. Except as provided for in Section ~~507.8.1.1~~ 507.1.3.1.1, Group H occupancies shall be located on the perimeter of the building. In Group H-2 and H-3 occupancies, not less than 25 percent of the perimeter of such occupancies shall be an *exterior wall*.

~~507.8.3~~ 507.2.3 Occupancy separations. *(no change)*

~~507.8.4~~ 507.2.4 Height limitations. *(no change)*

~~507.2~~ 507.3 Nonsprinklered, one story. The area of a Group F-2 or S-2 building no more than one *story* in height shall not be limited. ~~where the building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.~~

~~507.3~~ 507.4 Sprinklered, one story. The area of a Group B, F, M or S building no more than one *story above grade plane* of any construction type, or the area of a Group A-4 building no more than one story above grade plane of other than Type V construction, shall not be limited where the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1. ~~and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.~~

Exceptions:

1. Buildings and structures of Types I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.3 and 903.3.1.1 and Chapter 32 of the *International Fire Code*.
2. The *automatic sprinkler system* shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
   2.1. *Exit* doors directly to the outside are provided for occupants of the participant sports areas; and
   2.2. The building is equipped with a *fire alarm system* with *manual fire alarm boxes* installed in accordance with Section 907.

~~507.3.1~~ 507.4.1 Mixed occupancy buildings with Groups A-1 and A-2. *(no change)*

~~507.4~~ 507.5 Two story. The area of a Group B, F, M or S building no more than two *stories above grade plane* shall not be limited where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1~~,~~. ~~and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.~~

~~**507.5 Reduced open space.** The *public ways* or *yards* of 60 feet (18 288 mm) in width required in Sections 507.2, 507.3, 507.4, 507.6 and 507.11 shall be permitted to be reduced to not less than 40 feet (12 192 mm) in width provided all of the following requirements are met:~~

1. ~~The reduced width shall not be allowed for more than 75 percent of the perimeter of the building.~~
2. ~~The *exterior walls* facing the reduced width shall have a *fire-resistance rating* of not less than 3 hours.~~
3. ~~Openings in the *exterior walls* facing the reduced width shall have opening protectives with a *fire protection rating* of not less than 3 hours.~~

~~507.6~~ 507.6 Group A-3 buildings of Type II construction. The area of a Group A-3 building no more than one *story above grade plane*, used as a *place of religious worship*, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor *swimming pool* or tennis court of Type II construction, shall not be limited provided all of the following criteria are met:

1. The building shall not have a *stage* other than a *platform*.

2. The building shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. ~~The building shall be surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.~~

~~507.7~~ <u>507.7</u> Group A-3 buildings of Types III and IV construction. The area of a Group A-3 building of Type III or IV construction, with no more than one *story above grade plane*, and used as a *place of religious worship*, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor *swimming pool* or tennis court, shall not be limited provided all of the following criteria are met:

1. The building shall not have a *stage* other than a *platform*.
2. The building shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all *exits* are provided with ramps complying with Section 1010.1 to the street or grade level.
4. ~~The building shall be surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.~~

~~507.9~~ <u>507.8</u> Aircraft paint hangar. The area of a Group H-2 aircraft paint hangar no more than one *story above grade plane* shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.6 ~~and is surrounded and adjoined by *public ways* or *yards* not less in width than one and one-half times the *building height*~~.

~~507.10~~ <u>507.9</u> Group E buildings. The area of a Group E building no more than one *story above grade plane*, of Type II, IIIA or IV construction, shall not be limited provided all of the following criteria are met:

1. Each classroom shall have not less than two *means of egress*, with one of the *means of egress* being a direct *exit* to the outside of the building complying with Section 1020.
2. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. ~~The building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.~~

~~507.11~~ <u>507.10</u> Motion picture theaters. In buildings of Type II construction, the area of a motion picture theater located on the first *story above grade plane* shall not be limited provided the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1 ~~and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width~~.

~~507.12~~ <u>507.11</u> Covered and open mall buildings and anchor buildings. The area of *covered and open mall buildings* and *anchor buildings* not exceeding three *stories* in height that comply with Section 402 shall not be limited.

Reason: The primary intent of this code changes is to reorganized the text for enhance understanding. As it currently stands, provisions for the 60 foot surrounding open space is repeated in nearly each building type, but the exception to the 60 feet is in Section 507.4 and how to measure the 60 feet is in 507.1. Further, the allowance for accessory uses in unlimited area buildings is buried in an exception to the general statement on unlimited area buildings and the provisions for accessory Group H occupancies sits alone in Section 507.8. The proposal organizes the section as follows:

507.1 General
  507.1.1 – Open space requirements
  507.1.1.1 – Reduced open space
  507.1.2 – Accessory Occupancies
  507.1.3 – Group H occupancies
507.2 – single story F-2 and S-2
507.3 – single story B, M, S and F (and sometimes A4)
  507.3.1 – A-1 and A-2 in a 507.3 building
507.4 – two story B, M, S and F
507.5 – Group A-3 in Type II
507.6 – Group A-3 in Type III or IV
507.8 – Group E
507.9- Motion Picture

507.10 – covered malls

Please note that the text for the reduction in the surrounding open space was specifically allowed for 5 of the unlimited area building types. It didn't allow it for covered mall buildings, but Section 402 does allow a reduction. Therefore the new is added to prohibit the open space reduction for 3 building types and provide a reference to the reduction allowance for covered mall buildings. Group H is moved after accessory occupancies because the text of Section 507.8 essentially limits the height and area of H occupancies in these buildings in the same manner as accessory occupancies in general. Finally the reason that Section 507.3.1 is left where it is and not moved to be a subset of accessory occupancies is that the placement of Group A-1 oar A-2 in a Section 507.3 building is an additional primary occupancy which must meet the special rules of Section 507.3.1.

Cost Impact: The proposed changes will not increase the cost of construction.

G114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507-G-RICE.doc

G115 – 12
507.1

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

507.1 General. The area of buildings of the occupancies and configurations specified in Sections 507.1 through 507.12 shall not be limited. Basements not more than one story below grade plane shall be permitted.

Exception: Other occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2.

Where Sections 507.2 through 507.12 require buildings to be surrounded and adjoined by *public ways* and *yards,* those open spaces shall be determined as follows:

1. *Yards* shall be measured from the building perimeter in all directions to the closest interior *lot lines* or to the exterior face of an opposing building located on the same *lot*, as applicable.
2. Where the building fronts on a *public way*, the entire width of the *public way* shall be used.

Reason: Intended to clarify the existing provision that is currently silent on whether or not a basement is permitted under any of the unlimited area building provisions. However, the code is a permissive code, i.e. either the code provisions explicitly prohibit or provide specific requirements that control the construction of buildings and conditions. If the Code does not prohibit a particular building design or process, or the Code does not control the building design or process with specific requirements, then it is permitted by Code. Therefore, since the Code is silent on whether or not an unlimited area building can have a basement, the Code therefore permits a basement, or for that matter, multiple basements.

This issue had been discussed in the past at one of the legacy code development cycles back in 1985 (BOCA Code Proposal B23-85). That code proposal attempted to add to the unlimited one story sprinklered building provisions that such building "…do not contain a basement…". It should be noted that the legacy BOCA & SBCCI Codes did not have unlimited area provisions for 2 story sprinklered buildings like the legacy UBC or the present IBC do permit. BOCA Code Proposal B23-85 was denied by the BOCA Code Development Committee with the following reason: "A total prohibition of basement areas would be unnecessarily restrictive. Certain industrial processes require the use of below-floor areas by nature of the process. Some amount of basement area would be acceptable if limited in size."

Through discussion between the BCAC and FCAC Committee it was agreed that the basement conditions should be codified similar to what is now permitted for buildings designed under the general height and area requirements of the Code (See Section 506.4 Exception and Section 506.5). Any sprinkler provisions in Section 507 would also be applicable to the basement as well. In addition, the sprinkler provisions of Section 903.2.11.1 would also be applicable to unlimited area nonsprinklered buildings designed under Section 507.2 (Group F-2 or S-2).

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: The proposed changes will not increase the cost of construction..

G115-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.1#1-G-BAJNAI-BCAC

G116 – 12
507.1, 507.1.1 (NEW)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

507.1 General. The area of buildings of the occupancies and configurations specified in Sections 507.1 through 507.12 shall not be limited.

~~**Exception:** Other occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2.~~

Where Sections 507.2 through 507.12 require buildings to be surrounded and adjoined by *public ways* and *yards,* those open spaces shall be determined as follows:

1. *Yards* shall be measured from the building perimeter in all directions to the closest interior *lot lines* or to the exterior face of an opposing building located on the same *lot*, as applicable.
2. Where the building fronts on a *public way*, the entire width of the *public way* shall be used.

507.1.1 Accessory occupancies. Accessory occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2, otherwise the requirements of Sections 507.2 through 507.12 shall be applied, where applicable.

Reason: Intended to be editorial to provide better understanding and clarify the existing provision. The exception was deleted and placed as a subsection of Section 507.1. As a subsection, the requirement for accessory occupancies permitted in unlimited area buildings is clarified that if such occupancies do not meet the Section 508.2 (and its subsections) requirements, then the requirements for unlimited area buildings in Section 507.2 through 507.12 would be applied to any such occupancy.

This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Cost Impact: The proposed changes will not increase the cost of construction..

G116-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.1#2-G-BAJNAI-BCAC

G117 – 12
507.1

Proponent: Ali M. Fattah City of San Diego, Development Services Department, representing San Diego Area Chapter of ICC (afattah@sandiego.gov)

Revise as follows:

507.1 General. The area of buildings of the occupancies and configurations specified in Sections 507.1 through 507.12 shall not be limited.

Exception:

1. Other occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2.
2. <u>Accessory occupancies classified as Group A, B, E, F, M, or S shall be permitted in unlimited area buildings when they exceed the limits in Section 508.2 where the most restrictive requirements in Sections 507.2 through 507.7 are satisfied and where the occupancies are separated in accordance with Section 508.4.</u>

Where Sections 507.2 through 507.12 require buildings to be surrounded and adjoined by *public ways* and *yards,* those open spaces shall be determined as follows:

1. *Yards* shall be measured from the building perimeter in all directions to the closest interior *lot lines* or to the exterior face of an opposing building located on the same *lot*, as applicable.
2. Where the building fronts on a *public way*, the entire width of the *public way* shall be used.

Reason: This code change is necessary to allow two unlimited area buildings to in essence be combined into one building. The permitted occupancies allowed in buildings not limited in area have been expanded since the legacy codes were combined into the IBC. Exception 1 permits accessory occupancies to be located in unlimited area buildings complying with Section 508.2 that limits the area of all accessory occupancies in the building to 10%.

The Section as published in the 2012 IBC limits the area of an accessory occupancy with a lower fire loading to that of the main occupancy for example a group E accessory to a group M. Strip shopping centers can include unlimited area buildings that house in the same building Group M, B, A-2, A-3, E occupancies.

- An existing multi-tenant unlimited area building complying with Section 507.7 can include a fitness center classified as Group A-3 however a mercantile occupancy cannot be permitted in the building since it is not accessory to the Group A. Even if the mercantile occupancy were accessory it would be limited to 10% of the floor area.
- An existing multi-tenant unlimited area building complying with Section 507.3 can include unlimited areas of Group S, F and M as well as Group B. however if a remodel changes a portion to Group A-3 such as a fitness center the group A would not be permitted even though it will include a fire load that is substantially less than group S storage or potentially more hazardous Group F.
- The reverse could be true where a large amusement facility such as a bowling alley cannot be included in a building that includes restaurants and mercantile occupancies however independently these uses can be in unlimited area buildings.

Section 507.3 includes B, F, M and S and allows limited A and E accessory uses. Section 507.3.1, 507.6, 507.7 and 507.10 allow Group A or E to be the primary occupancy and Group B, F, M and S or A or E to be accessory.

The proposed new exception 2 allows any combination of the occupancies other than Group H that area addressed in Section 507 to be located in combination with any of the other occupancies in the Section if the most restrictive requirements are satisfied.

Section 508.3 addresses non separated uses and is less restrictive than Section 508.2 in that it does not limit the aggregate area to 10% as the accessory uses occupancies and allows them to be located in a building not however unlike accessory occupancies the occupancies do not go away notwithstanding the type of construction limitation in Section 508.3.2 require

Cost Impact: None. The code change proposal will not increase the cost of construction.

G117-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.1-G-FATTAH

G118 – 12
507.4, 507.4.1 (NEW), 507.4.2 (NEW)

Proponent: David S. Collins, The Preview Group, Inc., The American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

507.4 ~~Two story~~ Group B, F, M or S. The area of a Group B, F, M or S ~~building no more than two *stories above grade plane*~~ shall not be limited where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

507.4.1 Two Story. Unlimited area buildings of Group B, F, M or S occupancies shall be limited to two stories in height if of Type V construction.

507.4.2 Three Story. Unlimited area buildings of Group B, E, F, M or S occupancies shall be limited to three stories in height if of Type I, II, III or IV construction.

Reason: The mall criteria in Section 402 are nothing more than a detailed description of another unlimited area building that includes many of the same occupancies that are already permitted to be unlimited based on various heights and types of construction. It isn't clear that there are special provisions within the mall

This change will allow a two story unlimited area building of B, F, M or S of any type of construction (Type V), but will also allow a three story building if of Types I, II, III or IV construction as permitted for mall buildings or anchor buildings in Section 402.

Cost Impact: The increased understanding of what the code intends regarding unlimited area buildings will significantly reduce the cost of design and review.

G118-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.4-G-COLLINS

G119 – 12
507.4

Proponent: Joel Bringhurst, CH2M Hill Engineers, representing IM Flash Technologies (jowl.bringhurst@ch2m.com)

Revise as follows:

507.4 Two story. The area of a Group B, F, H-5 M or S building no more than two *stories above grade plane* shall not be limited where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason: History of H-5 Occupancy

Semiconductor fabrication facilities were first constructed as B-2 occupancy prior to the 1985 Uniform Building Code (UBC). In the 1985 UBC the occupancy group of H-6 was first introduced. It was a new classification for semiconductor fabrication facilities and related support uses. The H-6 occupancy ultimately became the H-5 occupancy in the 2000 International Building Code (IBC).

The definitive guide for the introduction of the H-6 occupancy in the 1985 UBC was the book *H-6 Design Guide to the Uniform Codes for High Tech Facilities* written by Alfred Goldberg, P.E., H.A.I.A. (Consulting Engineer) and Larry Fluer (Technical Consultant – Hazardous Materials) . On page 3-2 the authors state the following:

> "For the new Group H, Division 6 class, the original use of most of the existing fabrication facilities was classified as Group B, Division 2. The new H-6 class has virtually the identical code provisions in Table Nos. 5-C and 5-D as does the B-2 class. The intent of the H-6 code change is to consider that there is no change in use involved where the present and prior use was as a semiconductor fabrication facility. The intent is simply to assign a new name or designation to the existing use (see Section 104(c))."
>
> "However, any future alterations or changes will require compliance with the applicable provisions of the new H-6 classification. As provided in Section 104(c), in no case should an existing fabrication facility be made to conform to the new H-6 provisions simply as a result of a jurisdiction adopting or utilizing the new code provisions, except for those portions where alterations or changes are undertaken."

At the inception of the H-6 occupancy, this statement established an equivalent relative hazard level between H-6 and B-2 occupancies. In their discussion of relative hazards of occupancies Goldberg and Fluer further state on page 3-4 that "these determinations are made based on Table Nos. 5-C and 5-D allowable for each of the occupancies being compared."

Table 5-C is "Basic Allowable Area for Buildings One Story in Height" and Table 5-D is "Maximum Height of Buildings." The allowable areas in Table 5-C for B-2 and H-6 occupancies for all construction types are exactly the same. The maximum heights in Table 5-D for B-2 occupancy are the same except for one story more than H-6 occupancy for all but the Type I-FR and Type II-FR construction types, which are somewhat higher than for H-6 occupancy.

The basic method for comparison of relative hazard of occupancies has long been established as being relative to allowable area and maximum height. On the basis of allowable area the B-2 and H-6 occupancies have the same hazard level. On the basis of height H-6 would be more hazardous than B-2 occupancy in a taller building.

Comparison of H-5 to Groups B, F, M, and S in IBC Section 507.4.

H-5 occupancy has the same allowable areas as B occupancy per IBC Table 503 for all construction types. IBC Table 503 now contains the information previously contained in Tables 5-C and 5-D in the 1985 UBC. The relationship between B and H-5 occupancies are unchanged from the relationship established between B-2 and H-6 occupancies in the 1985 UBC. This unchanged relationship is reinforced in the *2009 IBC Handbook: Fire and Life Safety Provisions*, page 84, which states:

> **"415.8 Group H-5.** The Group H-5 occupancy category was created to standardize regulations for semiconductor manufacturing facilities. This section provides the specific regulations for these occupancies. The H-5 category requires engineering and fire-safety controls that reduce the overall hazard of the occupancy to a level thought to be equivalent to a moderate hazard Group B occupancy. Accordingly, the areas permitted for Group H-5 occupancies are the same as for Group B occupancies."

H-5 occupancy has equal or greater allowable areas than F-1, M and S-1 occupancies for all construction types per IBC Table 503. As F-1, M and S-1 occupancies are included in the existing provisions for the unlimited area building, this could even be interpreted to indicate that H-5 occupancy, with all of its code-required mitigating features, is less hazardous than F-1, M and S-1 occupancies.

The maximum height in stories for H-5 occupancy is less than or equal to the maximum height for B occupancy in IBC Table 503, however, in no case is the maximum height of H5 occupancy less than 2 stories. The relative maximum height relationship between B and H-5 occupancies are relatively unchanged from the relationship established between B-2 and H-6 occupancies in the 1985 UBC. When it comes to height in stories it is acknowledged that H5 is more hazardous than B occupancy as the number of stories in the B is higher. This proposal for unlimited area per IBC Section 507.4 is within a provision that is conditional upon a two-story limitation; therefore this proposal is limited to the hazard comparison to allowable area provisions only from IBC Table 503.

H-5 occupancy has a significant number of IBC requirements that mitigate the hazards of H-5 compared to B occupancy in general. These mitigating requirements have effectively equalized the two occupancies in terms of relative hazard, which is demonstrated by the equal allowable areas of the two occupancies within IBC Table 503, which has remained consistent over time. Again from the *2009 IBC Handbook*, p84:

> "The code requires that special ventilation systems be installed in fabrication areas that will prevent explosive fuel to air mixtures from developing. The ventilation system must be connected to an emergency power system. Furthermore, buildings containing Group H-5 occupancies are required to be protected throughout by an automatic fire-sprinkler system and fire and emergency alarm systems. Fire and emergency alarm systems are intended to be separate and distinct systems, with the emergency-alarm system providing a signal for emergencies other than fire. This section also provides requirements for piping and tubing that transport hazardous materials that allow piping to be located in exit corridors and above other occupancies subject to numerous, stringent protection criteria. The provisions for Group H-5 occupancies are correlated with companion provisions in Chapter 18 of the IFC."

Any hazards introduced by the inclusion of an unlimited area H5 occupancy in an unlimited area building per IBC Section 507.4 would be mitigated by sprinklers, side yards, and limits in story height the same as Groups B, F, M and S occupancies, which as compared in previous paragraphs, have equal or more hazard based on a relative allowable area comparison to H-5 occupancy.

Group H occupancies are currently allowed in unlimited area buildings per IBC Section 507.8. The occupancies specifically addressed are H-2, H-3, and H-4. These three occupancies are restricted to an area of 10 percent of the unlimited area building or the Table 503 limits. This establishes that specific uses of H occupancies with more hazard than H-5 are permitted in an unlimited area building. However, the restrictions in these provisions to H occupancies in IBC Section 507.8 are limited to H2, H3 and H4 and do not apply to H-5 occupancy, which is relatively less hazardous.

Differences between H-5 and Groups B, F, M and S

H-5 occupancy contains Hazardous Production Materials (HPMs). The B, F, M, and S occupancies are also permitted to have hazardous materials, but the quantity cannot exceed the Maximum Allowable Quantizes (MAQ) in Tables 307.1 (1) and 307.1 (2). H-5 occupancy has numerous code-required mitigating features that effectively address the hazards of H5 and will not be impacted or reduced by this requested code change. The requirements of IBC Section 415.8 and other areas of the code relating to H-5 occupancy will remain in effect in their entirety with this proposal.

If H-5 occupancy is added to IBC Section 507.4 the H-5 occupancy will still be regulated relative to construction type and building height by IBC Chapter 5.

Conclusion

H-5 occupancy has a relative hazard based on allowable area per IBC Table 503 that is equal to or better than B, F, M, and S occupancies. Adding H-5 occupancy to the occupancies that are allowed to have unlimited area per IBC Section 507.4 would be consistent with the permitted level of hazard and mitigation established by this section. The code-required mitigating features of H-5 occupancy have been demonstrated for over 25 years to be effective since the introduction of the semiconductor fabrication facility occupancy in the 1985 UBC.

Cost Impact: Cost savings from Type I Construction, which is required for unlimited H-5 in Table 503

G119-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.4-G-BRINGHURST

G120 – 12
507.5.1 (NEW)

Proponent: David Scott, Target (David.Scott@target.com)

Add new text as follows:

507.5.1 Property Lines. Multiple, contiguous, individual buildings may be considered as one building for the purpose of determining allowable area if the following conditions are met:

1. Permanent open space on all sides as required by Section 507.1, 507.2, 507.3, 507.4, or 507.5: and

2. Proper legal agreements recorded with the deed for each of the separate properties. These recorded agreements shall require that the buildings as divided by property lines, be in conformance with the applicable provisions of this code, as if the buildings were a single building on a single piece of property. In addition, the agreement must state that no individual building or property owner may modify any portion of the building in any way that would not be in compliance with this code.

Reason: This allows individual building owners to purchase the land under their building within an overall development. Previously, a strip center type development could have a lease line between individual tenants. Replacing a lease line with a property line does not create any further hazard.

Cost Impact: The code change proposal will not increase the cost of construction.

G120-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.5.1 (NEW)-SCOTT

G121 – 12
507.8

Proponent: Homer Maiel, PE, CBO, Town of Atherton (CA), representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

507.8 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F ~~and~~ <u>or</u> S occupancies, in accordance with Sections 507.3 and 507.4 and the provisions of Sections 507.8.1 through 507.8.4.

Reason: The word "and" implies that both Groups F <u>and</u> S have to be present in a building in order for this section to apply. Word "or" eliminates that misunderstanding.

Cost Impact: This code change will not increase the cost of construction.

G121-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.8-G-MAIEL

G122 – 12
507.12

Proponent: Jerry R. Tepe, FAIA, JRT•AIA Architect, representing The American Institute of Architects (jrtaia@aol.com)

Revise as follows:

507.12 Covered and open mall buildings and anchor buildings. The area of *covered and open mall buildings* and *anchor buildings* not exceeding three *stories* ~~in height~~ above grade plane that comply with Section 402 shall not be limited.

Reason: Revises the undefined term "height" to the appropriate language of "above grade plane." There is no technical change intended.

Cost Impact: The proposed changes will not increase the cost of construction.

G122-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.12-G-TEPE

G123 – 12
508.1, 508.2, 508.2.1, 508.2.3, 508.3, 508.3.1, 508.3.2, 508.4, 508.4.1, 508.4.2, 508.4.3

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@keith@mac.com)

Revise as follows:

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy classification ~~group~~, each story containing mixed occupancies shall comply with one of the design options specified in Section 508.2, 508.3 or 508.4. All stories within the same building are not required to use the same mixed occupancy design option. ~~the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.~~

Exceptions:

1. Accessory occupancies shall be permitted in conjunction with the non-separated design option where remainder of the story complies with Section 508.3.2.

~~1~~ 2. Occupancies separated in accordance with Section 510.

~~2~~ 3. Where required by Table 415.3.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a detached building or structure.

~~3~~ 4. Uses within live/work units, complying with Section 419, are not considered separate occupancies.

508.2 Accessory ~~occupancies~~ occupancy design option. Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4.

~~**508.2.1 Area limitations.** Aggregate accessory occupancies shall not occupy more than 10 percent of the *building area* of the *story* in which they are located and shall not exceed the tabular values in Table 503, without *building area* increases in accordance with Section 506 for such accessory occupancies.~~

~~508.2.2~~ 508.2.1 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.

~~508.2.3~~ 508.2.2 Allowable building area and height. In each *story*, the allowable *building area* ~~*and height*~~ ~~of the building~~ shall be based on the allowable *building area* ~~*and height*~~ for the main occupancy in accordance with Section 503.1. Aggregate accessory occupancies shall not occupy more than 10 percent of the *building area* of the *story* in which they are located and shall not exceed the tabular values in Table 503, without *building area* increases in accordance with Section 506 for such accessory occupancies. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. ~~The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1.~~

~~508.2.4~~ 508.2.3 Separation of occupancies. No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

508.3 Nonseparated ~~occupancies~~ occupancy design option. Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.

508.3.1 Occupancy classification. Non-separated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the story ~~building~~ based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 that ~~which~~ apply to the non-separated occupancies shall apply to the total story ~~non-separated occupancy area~~. Where non-separated occupancies occur in a high-rise building, the most restrictive requirements of Section 403 that ~~which~~ apply to the non-separated occupancies shall apply throughout the high-rise building.

508.3.2 Allowable building area and height. In each *story*, the allowable *building area and height*, in feet and number of stories, ~~of the building or portion thereof~~ shall be based on the most restrictive allowances for the occupancy classifications ~~groups~~ under consideration for the type of construction of the building in accordance with Section 503.1.

508.3.3 Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from other occupancies contiguous to them in accordance with the requirements of Section 420.

508.4 Separated ~~occupancies~~ occupancy design option. Buildings or portions of buildings that comply with the provisions of this section shall be considered as separated occupancies.

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)
(No change to table or footnotes)

508.4.1 Occupancy classification. Separated occupancies shall be individually classified in accordance with Section 302.1. ~~Each separated space shall comply with this code based on the occupancy classification of that portion of the building.~~ The requirements of this code shall apply to each portion of the story based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 that apply to occupancies not required to have an occupancy separation in accordance with Table 508.4, shall apply to the total un-separated occupancy area. Where such un-separated occupancies occur in a high-rise building, the most restrictive requirements of Section 403 that apply to the un-separated occupancies shall apply throughout the high-rise building.

508.4.2 Allowable building area. In each *story*, the *building area* shall be such that the sum of the ratios of the actual *building area* of each ~~separated~~ occupancy divided by the allowable *building* area of each ~~separated~~ occupancy shall not exceed 1.

508.4.3 Allowable height. Each ~~separated~~ occupancy shall comply with the *building height* and number of story limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions permitted by Section 510 shall permit occupancies at *building heights* other than provided in Section 503.1.

508.4.4 Separation. Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

508.4.4.1 Construction. Required separations shall be *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies.

Reason: Section 508, which specifies the provisions applicable to mixed occupancies, has evolved over the relatively short life of the IBC. Most of these changes resolved inconsistencies between the legacy codes in this fundamental technical area and have resulted in a rational system of viable and relative design options based on relative risk. Some organizational or formatting changes were included in the previous revisions. This proposal is intended to correct lingering technical inconsistencies and offer final improvements to the organization and intent of mixed occupancy requirements.

The most important feature of this proposal is to clarify that individual design options (accessory, non-separated and separated) apply to an entire story; however, different design options can be used for various individual stories within a building. This is necessary so as to maintain the integrity of the IBC system for allowable area determination. Each design option specifies a method for allowable area determination. The allowable area of accessory occupancies is based on the allowable building area for the main occupancy (Section 508.2.3). The allowable area of non-separated occupancies is based on the most restrictive allowances for the occupancy classifications under consideration for the type of construction of the building (Section 508.3.2). The allowable area of separated occupancies is based on a unity formula calculation (Section 508.4.2). It should be noted that a new Exception 1 to Section 508.1 permits accessory occupancies (those occupancies occupying no more than 10% of the area of the story nor more that the tabular allowable area for such occupancy) to occur in conjunction with the non-separated mixed occupancy design option. This is a traditional interpretation based on some legacy codes and does no harm. Since neither the accessory occupancy nor the non-separated design options generally require a physical occupancy separation and the allowable area is reasonably controlled based on the most restrictive allowances of the occupancies not qualifying as accessory, a combination of these two mixed occupancy design options is acceptable.

Otherwise, if different mixed occupancy design options are used within a given story, the resulting gross floor level could be much larger than intended based on Table 503 and relative risk. For instance:

GIVEN:

A sprinklered, two story building of Type IIA construction.
A building story having a floor area of 79,500 square feet and containing three individual occupancies:
A Group A-2 occupancy having a floor area of 5,500 square feet
A Group B occupancy having a floor area of 14,000 square feet
A Group F-1 occupancy having a floor area of 60,000 square feet

DETERMINE:

Is the building area for the story under consideration acceptable?

SOLUTION:

Examine the occupancies under consideration to determine if the story qualifies for the non-separated mixed occupancy design option. The occupancy classification requiring the most restrictive allowable area allowance is Group A-2. The floor area of the story (79,500 sf) is greater than that permitted for the most restrictive occupancy (46,500 sf). Therefore, the story does not qualify for the non-separated occupancy design option. Determine if the story qualifies for the accessory mixed occupancy design option. The floor area of the aggregate accessory occupancies of the story (19,500 sf) is greater than 10 percent of the building area of the story in which they are located (24.5 %). Therefore, the story does not qualify for the accessory occupancy design option. Determine if the story qualifies for the separated mixed occupancy design option. The sum of the ratios of the actual building area of each occupancy divided by the allowable building area of each occupancy exceeds 1: [(5,500 ÷ 46,500) + (14,000 ÷ 112,500) + (60,000 ÷ 75,000)] = 1.042. Therefore, the story does not qualify for the separated occupancy design option. Accordingly, the building does not comply with any of the three mixed occupancy design options. Therefore, the building must be redesigned by upgrading the type of construction, reconfiguring the occupancies, including building frontage, etc.

Combining design options within a given story is not permitted. Creativity may erroneously determine that such combination is acceptable. Such logic might follow:

Consider the Group A-2 occupancy as being accessory to the Group F-1 occupancy (9.2 %). Then consider the accessory occupancy portion of the story as an individual occupancy and evaluate the resultant Group F-1 and B occupancies as separated occupancies [(65,500 ÷ 75,000) + (14,000 ÷ 112,500)] = .997, therefore OK. This is an unacceptable practice for two reasons. First, Section 508.3.2 states that, "The allowable *building area and height* of the building shall be based on the allowable *building area and height* for the main occupancy in accordance with Section 503.1." What is not the main occupancy (Group F-1), is regarded as the accessory occupancy(s) (Groups A-2 and B). In this case, the accessory occupancies comprise 24.5 percent of the building area of the story in which they are located (current Section 508.2.1). Secondly, Section 508.4.1 states, "Separated occupancies shall be individually classified in accordance with Section 302.1." Additionally, Section 508.4.2 states that when determining the allowable area using the separated occupancy design option, "In each *story*, the *building area* shall be such that the sum of the ratios of the actual *building area* of each separated occupancy divided by the allowable *building* area of each separated occupancy shall not exceed 1. The consolidation of occupancies is not recognized. When design options are combined, the technical assumptions and relationships are lost.

The concept of mixed occupancy allowable area determination is based on limiting the area based on relative risk and the degree of occupancy separation. Therefore, it is critical that the allowable area based on fuel load or occupancy related concerns be balanced so as not to exceed acceptable levels of risk.

From a logical point of view, it makes no sense to allow for a building area greater than that allowed by any of the three design methods. The concept of mixed occupancy allowable area determination is based on limiting the area based on relative risk and the degree of occupancy separation. Each of the methods weighs the required occupancy separation with the relative size of the story under consideration. Generally speaking, occupancy separations are not required when using the accessory occupancy or non-separated occupancy design options. The accessory occupancy option assumes that the percentage or size of the ancillary occupancies is sufficiently small so as to not to create an unacceptable level of relative risk without formal occupancy separations. The non-separated option assumes that since the proportion is not regulated, using the most restrictive requirements of the occupancies under consideration mitigates the need for formal occupancy separations. The separated option requires the performance of the sum of the ratios calculation to balance the relative risk and fuel load to no more than would ordinarily be experienced in single occupancy buildings. Additionally, where the occupancies under consideration are of dissimilar risk, formal occupancy separations are required with the separated design option.

In the original example, assuming that the building qualified for the separated occupancy design option, a one-hour fire-resistance rated occupancy separation would be required between the Group A-2 and the Group F-1 occupancies. The incorrect method of combining the design options within a given story allows an area greater than that allowed by the separated mixed occupancy design option and eliminates the required occupancy separation.

This issue also impacts the determination of the total allowable area in multistory mixed occupancy buildings. Section 506.5.2 requires that, “For buildings with more than three *stories above grade plane*, the total *building area* shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* based on the applicable provisions of Section 508.1 shall not exceed 3.” The divisor necessarily needs to comply with one of the three mixed occupancy design options so as not to skew the overall building area calculation.

It is unfortunate that this rationale could not have been incorporated into previous modifications to Section 508. The nature of the code development process does not generally embrace comprehensive code changes, especially for contentious subject areas. The recommended modifications to Section 508 clarify the intent and introduce additional balance into IBC mixed occupancy procedures.

It is proposed that the sections applicable to allowable building area determination for the accessory and non-separated design options be revised to include identical charging language, “In each story, …” as is the case with the separated design option in Section 508.4.2. Additionally, Section 508.1 has been reworded to specify that, “…each story containing mixed occupancies shall comply with one of the design options specified in Section 508.2, 508.3 or 508.4.

Some additional housekeeping changes are also included. Section 508.2.1 has been deleted and included in current Section 508.2.3. This move is consistent with the format of each of the design option subsections and technically consistent with the section heading, “Allowable building area and height.” Additional editorial corrections have been made so as to be consistent with intent.

During discussion of mixed occupancy provisions during the previous code development cycle, it was noted that the provisions of Section 508.3.1 applicable to non-separated occupancies should also be made applicable to those occupancies not requiring an occupancy separation based on Table 508.4 for the separated design option. Section 508.4.1 has been modified to reflect that technical concern.

In summary, mixed occupancy provisions have continually evolved since the publication of the inaugural 2000 Edition of the IBC. The fundamental system of three mixed occupancy design options in Section 508 and incidental uses in Section 509 is contained in the 2012 IBC. This proposal intends to provide final adjustment and clarification to this system. Approval of this proposal will enhance consistency in the application of these very fundament provisions.

Cost Impact: This code change proposal will not increase the cost of construction.

G123-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

508.1-G-KEITH

G124 – 12
508.1

Proponent: Ali M. Fattah, City of San Diego – Development Services Department, representing San Diego Area Chapter of ICC (afattah@sandiego.gov)

Revise as follows:

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 510.
2. Where required by Table 415.5.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a *detached building* or structure.
3. Uses within *live/work units*, complying with Section 419, are not considered separate occupancies.
4. <u>Closets and storage rooms each not exceeding 100 sq ft in floor area and not used for the storage of hazardous materials regulated in Section 414 when the total floor area of such rooms is not more than 10% of the floor area of the story in which they are located.</u>
5. <u>Mechanical and electrical rooms not regulated as incidental uses in Section 509 where each room does not exceed 100 sq ft in floor area and when the total floor area of such rooms is not more than 10% of the floor area of the story in which they are located.</u>

Reason: This code change is necessary to allow storage rooms and closets located in any occupancy to not be considered an S occupancy. The revisions to the incidental uses Table 509 over the last two code cycles removed small storage rooms as a consequence they need to be classified as Group S and considered accessory use or a separated or non-separated occupancy.

Closets and storage rooms located in occupancies in multistory buildings permitted otherwise to be of non-rated construction will be limited to buildings constructed of Type VA, IIIA or IIA construction or better. For example storage rooms and closets located above the second floor in a Group R-1 or Group R-2 occupancy four stories in height will require one-hour construction throughout or will not be permitted above the second story. Another example is a janitor's closet in a common area or a janitor's closet located within a multi-tenant building. Proposed exception 4 seeks to address this issue.

A small electrical/mechanical room located on the 5th floor of a type IIB building would not be permitted as accessory uses since Section 508.2.3 requires that the allowable height be established without increase for the accessory use. The electrical code and mechanical code and incidental use requirements will require the appropriate separation from the remainder of the building where appropriate. Proposed exception 5 addresses this issue.

Cost Impact: None. The code change proposal will not increase the cost of construction.

G124-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

508.1-G-FATTAH

G125 – 12
508.2.1, 508.2.3

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

508.2.1 Area limitations. ~~Aggregate accessory occupancies shall not occupy more than 10 percent of the *building area* of the *story* in which they are located and shall not exceed the tabular values in Table 503, without *building area* increases in accordance with Section 506 for such accessory occupancies.~~ The aggregated area of the accessory occupancies located on a story shall not occupy more than 10 percent of the building area of the story in which they are located and shall not exceed the tabular values in Table 503. The building area increases in accordance with Section 506 shall not apply to accessory occupancies. The allowable building area of each story including the area of accessory occupancies shall be based on the allowable building area for the main occupancy.

508.2.3 ~~Allowable building area and height~~ Height limitations. ~~The allowable *building area and height* of the building shall be based on the allowable *building area and height* for the main occupancy in accordance with Section 503.1.~~ The height of each accessory occupancy shall not exceed the tabular values in Table 503. ~~, without~~ The building height increases in accordance with Section 504 shall not apply to ~~for such~~ accessory occupancies. ~~The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1.~~

Reason: The provisions for accessory occupancies currently jumble the discussion of the height limit for accessory occupancies with a restatement of the area limits of the whole building. This proposal does 2 things. It puts the regulations on area only in Section 508.2.1 and the regulations on height only in 508.2.3. It rewords each to provide clarity of the provision.

The final sentence of the revised Section 508.2.1 is currently the first sentence of Section 508.2.3. The sentence as it stands seems to be a repeat of the obvious – that the building area is determined by the regulations for building area. The revised sentence in 508.2.1 makes the connection with accessory occupancies that the area of the accessory occupancy is included in the total area. This is a distinction with the separated occupancy approach where you have to factor the allowable areas of each use. Even with the revision to the sentence, it might be better to delete it completely from the code.

Cost Impact: The proposed changes will not increase the cost of construction.

G125-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

508.2.1-G-RICE

G126 – 12
508.2.3

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

508.2.3 Allowable building area and height. The allowable *building area and height* of the building containing accessory occupancies shall be based on the allowable *building area and height* for the main occupancy in accordance with Section 503.1. ~~The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies.~~ The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1.

Reason: The current text of 508.2.3 literally limits the location of an accessory occupancy in a building to the tablular height in Table 503 for the occupancy of the accessory occupancy. Imposing this limit is a total contradiction to what the accessory occupancy design option was intended to allow. When literally applied, an office building of Type IIC construction that is allowed to be 4 stories in height with sprinklers, could not have closets or storage rooms above the 2nd story as they are a Group S-1 (storage) occupancy and the tabular height limit in Table 503 is 2 stories.

And I emphasize "tabular" height limit because as the code is currently written, no height increase can be taken for a fully sprinklered building used when determining the vertical location of an accessory occupancy.

Another example would be linen storage rooms (Group S-1) in hotels of Type IIB construction. Based on Table 503 the tabular building height limit (in stories) for a Group S-1 occupancy is 2 stories, where the hotel (Group R-2) is allowed to be up to 5 stories when sprinklered. Because Group S-1 occupancies are not allowed above the 2nd story, linen storage closets would not be allowed above the 2nd story – a hotel cannot literally function without those storage spaces.

Without this code change many building designs as we know them today would continue to literally not be allowed.

Cost Impact: The proposed changes will not increase the cost of construction.

G126-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

508.2.3-G-RICE sar comments.doc

G127 – 12
Table 508.4

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., (tcrimi@sympatico.ca), representing North American Insulation Manufacturers Association (NAIMA)

Revise as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1[a], I-3, I-4		I-2		R[a]		F-2, S-2[b], U		~~B,~~ F-1, M, S-1		B		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1[a], I-3, I-4	—	—	N	N	2	NP	1	NP	1	2	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R[a]	—	—	—	—	—	—	N	N	1[c]	2[c]	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2[b], U	—	—	—	—	—	—	—	—	N	N	1	2	1	2	NP	NP	3	4	2	3	2	NP
~~B,~~ F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	2	3	1	2	1	NP
B	—	—	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2	1	NP
H-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP	1	NP
H-3, H-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1[d]	NP	1	NP
H-5	—	—	—	—	—	—	—	—	—	—	—	—			—	—	—	—	—	—	NP	NP

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification.

Reasons: The purpose of this Code change is to break out the Group B Occupancies from Groups F-1, M, and S-1 since the current grouping in Table 508.4 does not represent similar hazards, and results in no fire separations being required between these.

This proposal aims to restore a portion of the level of protection afforded in the 2003 IBC and many of the Legacy Codes. While the current Table 508.4 was first revised for the 2006 IBC, few jurisdictions had any history with the lack of fire resistance rated separations between occupancies which the 2006 IBC would now permit.

As the table is currently formatted for required separation of occupancies under the separated occupancies option of Section 508.4, there is no occupancy separation required between any of the occupancies in the B, F-1, M, and S-1 Grouping, as indicated by the letter “N” contained in the table for those occupancy groups. However, a Group B occupancy generally has a significantly lower fire load than the Group F-1, M, and S-1 occupancies, and the occupancy hazard is different as well.

If Table 508.4 truly implements the separated occupancies option which mandates occupancy separations as compared to the nonseparated occupancies option in Section 508.3 which does not, it follows that there should be occupancy separations required between occupancies with different hazard characteristics. Group B occupancies generally have combustible fire loads less than 10 pounds per sq ft, as compared to the Group F-1, M, and S-1 occupancies which could have fire loads as much as 20 to 30 pounds per sq ft or more. Therefore, we have proposed a minimum 2-hour occupancy separation between the Group B occupancies and the Group F-1, M, and S-1 occupancies in nonsprinklered buildings and a minimum 1-hour fire-resistance rating in sprinklered buildings. This is consistent with the other occupancy classifications requiring occupancy separations between them and the Group F-1, M, and S-1 occupancies.

It should also be noted that this is consistent with the required occupancy separation for Group B/M mixed occupancies in former Table 302.3.2 of the 2003 IBC which Table 508.4 replaced in the 2006 IBC. And it is actually less restrictive than former Table 302.3.2 for the Group B/F-1 and Group B/S-1 mixed occupancies separations.

The concept of separation of major occupancies exists in Building regulations throughout the world. Certainly, those occupancy separations requirements used in the separated occupancies option have stood the test of time. There continues to be a critical need to separate adjacent major occupancies of dissimilar use, with fire-resistance rated construction. The previous Table 302.3.2 had been is use for the three plus years it existed in the 2000 and 2003 editions of the IBC. Furthermore, the occupancy separation fire resistance ratings from this predecessor table were taken directly from the BOCA National Building Code, along with the entire concept of the non-separated and separated occupancies in mixed occupancy buildings.

As currently published, the 2009 Code provisions in Section 508 blur the distinction between separated uses and the non-separated use options previously prescribed in Section 302.3.1. The full impact of this change has not yet been felt.

Bibliography & References:
[1] 2003 IBC, International Codes Council, Table 302.3.2
[2] 1996 BOCA National Building Code, BOCA
[3] 1997 Standard Building Code, SBCCI
[4] 1997 Uniform Building Code, ICBO

Cost Impact: The proposal will increase the cost of construction.

G127-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T508.4-G-CRIMI

G128 – 12
Table 508.4

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1[a], I-3, I-4		I-2		R[a]		F-2, S-2[b], U		B[e], F-1, M, S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
B[e], F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2	1	NP

(Portions of table not shown remain unchanged)

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. See Section 420.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.3.4.
d. Separation is not required between occupancies of the same classification.
e. See Section 422.2 for ambulatory care facilities.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

This footnote reminds the reader that although there is no separation required for many B occupancy to other occupancies that Section 422.2 would still require a 1 hour fire partition between other group B occupancies and F-1, M and S-1 occupancies.

Cost Impact: None

G128-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T508.4-G-WILLIAMS-ADHOC

G129 – 12
509, 509.1

Proponent: Sarah A. Rice, C.B.O, The Preview Group (srice@preview-group.com)

Revise as follows:

SECTION ~~509~~ 425
INCIDENTAL USES

~~509.1~~ 425.1 General Incidental uses located within ~~single occupancy or mixed occupancy~~ buildings shall comply with the provisions of this section. Incidental uses are ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy and are limited to those uses listed in Table ~~509~~ 425.

> **Exception:** Incidental uses within and serving a *dwelling unit* are not required to comply with this section.

~~509.2~~ 425.2 Occupancy classification. Incidental uses shall not be individually classified in accordance with Section 302.1. Incidental uses shall be included in the building occupancies within which they are located.

~~509.3~~ 425.3 Area limitations. Incidental uses shall not occupy more than 10 percent of the *building area* of the *story* in which they are located.

~~509.4~~ 425.4 Separation and protection. The incidental uses listed in Table ~~509~~ 425 shall be separated from the remainder of the building or equipped with an *automatic sprinkler system*, or both, in accordance with the provisions of that table.

~~509.4.1~~ 425.4.1 Separation. Where Table ~~509~~ 425 specifies a fire resistance- rated separation, the incidental uses shall be separated from the remainder of the *building* by a *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both. Construction supporting 1-hour *fire barriers* or *horizontal assemblies* used for incidental use separations in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

~~509.4.2~~ 425.4.2 Protection. Where Table ~~509~~ 425 permits an *automatic sprinkler system* without a *fire barrier*, the incidental uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor assembly below to the underside of the ceiling that is a component of a fire-resistance-rated floor assembly or roof assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.5.9.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental use shall not have air transfer openings unless provided with smoke dampers in accordance with Section 710.7.

~~509.4.2.1~~ 425.4.2.1 Protection limitation. Except as specified in Table ~~509~~ 425 for certain incidental uses, where an *automatic sprinkler system* is provided in accordance with Table ~~509~~ 425, only the space occupied by the incidental use need be equipped with such a system.

TABLE ~~509~~ 425
INCIDENTAL USES

(Portions of table not shown remain unchanged)

Reason: The proposal moves the regulations for Incidental Uses from Chapter 5 to Chapter 4. It makes no other changes. In the 2012 IBC, spaces identified as incidental uses by Table 509.1 are recognized as having unique characteristics that require unique protection methods. They are no longer part of the "mixed occupancy" philosophy of the code. The protection requirements for the incidental uses in Section 509 have no impact on the allowable height or area of the building and therefore no longer belong in Chapter 5; *General Building Heights and Areas*, but rather in Chapter 4; *Special Detailed Requirements Based on Use and Occupancy*. The intent of Chapter 5 is to establish the maximum allowable height and area of buildings where Chapter 4 is set up as the location where requirements specific and unique to a use or occupancy are located. Chapter 4 is already the location of special uses that aren't necessarily distinct occupancies, but require special design and protection. Examples include – Section 416 Application of Flammable Finishes; Section 417 Drying Rooms; Section 418 Organic Coatings and Section 421 Hydrogen Cutoff Rooms. The historic location of the incidental uses regulations in Chapter 5 was based on previous attempts to call them out as distinct uses or treat them as a subset of accessory occupancies.

The only change in text is found in new Section 425.1 where the phrase "single occupancy or mixed occupancy" has been deleted. When incidental uses was a subsection to the Mixed occupancy provisions the phrase was necessary. Now that incidental uses are addressed in a separate and unique section, the language is unnecessary.

Cost Impact: The proposed changes will not increase the cost of construction.

G129-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

509-G-RICE.doc

G130 – 12
Table 509

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

TABLE 509
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input.	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cutoff rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops~~,~~ not classified as Group H~~, located in Group E or I-2 occupancy~~	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops.	1 hour
In ambulatory care facilities or Group I-2 occupancies , waste and linen collection rooms ~~located in either Group I-2 occupancies or ambulatory care facilities~~ with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx This proposal is being co-sponsored by the ICC Code Technology Committee.

Currently, more detail is needed in the Incidental Use table to add spaces currently being maintained in healthcare and ambulatory care occupancies. The above chart makes the noted tables consistent with current operational and programmatic standards in the Group I-2 occupancy.

The current version of the table does not address the occasion when materials in a laboratory increases, most notably in the aggregate of larger histology / cytology laboratories. Materials such as xylene, hydrochloric acid, ethanol and fixatives (among others) are present in these areas. Although they are stored in gallon and liter quantities, and not bulk storage, the quantities add up over the larger lab control areas when they are in use at the benches.

The distinction between smaller stat labs, largely found in ambulatory care facilities, and larger clinical labs, found in hospitals, is being proposed. Ambulatory care facilities has been added to the current laboratory category to address those support spaces such as stat labs that are set up for a specific time-sensitive purpose, such as blood draw and chemotherapy, to save time in the Group B occupancy setting. Larger scale or non-critical lab operations are typically sent out to proprietary labs from ambulatory facilities. When addressing labs crossing the threshold into one hour rated construction, these labs are typically constructed as stand-alone operations and commonly appear in Group B occupancies, and are subject to the current occupancy separation requirements.

Volume thresholds are being considered in waste and linen collection rooms because basic exam spaces contain some level of waste containers and linen hampers without rising to the level of storage. The 10 cubic foot threshold represents essentially two medium sized linen hampers and/or trash receptacles. Larger linen and waste receptacle containers, and not the smaller containers typically found in an exam room or patient sleeping room, are subject to volume rather than square footage of the room because a relatively small space, with the 10 cubic foot threshold crossed in a space well below, for example, 100 square feet.

Group I-2 is also being added to the requirement for one hour rating with rooms equipped with padded surfaces. The instance of these rooms existing in a hospital is rare. It is prudent, however, to add the requirement where there is the occasion that such rooms are used in areas such as emergency departments, inpatient psychiatric units, or similar areas.

Physical plant and maintenance shops are a very specific function in a hospital building, and are being added to the table to ensure protection due to the stored materials related to the physical plant operation.

Addition of storage rooms as an area requiring 1 hour rated protection is a key functional aspect of a Group I-2 healthcare building. Areas that become unused become storage areas very quickly. Specifically calling out storage areas helps define and control the storage of combustibles, and avoid creating random storage in otherwise unmonitored or unprotected areas.

Areas addressed in the past, but are no longer included in the table, are addressed in the International Fire Code (IFC). For example, storage of combustible gases is addressed in IFC Section 5306.2 and has specific references to the Group I-2 occupancy. Gift shops, formerly listed as an incidental area requiring protection, have largely been eliminated from these requirements in the I-Codes and other model codes, and are addressed in the context of being open to the corridor.

In consideration of ambulatory care facilities, where not otherwise specifically called out, categories that are required for both Group B and I occupancies are assumed to cover Group I-2 and ambulatory care facilities. Examples of this interpretation are hydrogen cut-off rooms and stationary battery storage.

Cost Impact: The code change proposal will increase the cost of construction in facilities where the incidental uses occur.

G130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T509-G-WILLIAMS-ADHOCHEALTHCARE.doc

G131 – 12
509.3

Proponent: Steve Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (sthomas@coloradocode.net)

Delete without substitution:

~~**509.3 Area limitations.** Incidental uses shall not occupy more than 10 percent of the *building area* of the *story* in which they are located.~~

Reason: Incidental uses have been revised in every edition of the code. The original incidental uses did not have any area limitation and there were no reported issues through the 2006 edition of the IBC. When the uses were incorporated into accessory occupancies in the 2009 IBC, the 10 percent limitation was introduced. As the incidental uses were removed from the accessory occupancies, the 10 percent limitation was carried over. History has shown that the 10 percent limitation is not needed for incidental uses. This requirement is problematic in buildings where most if not all of the building is dedicated to uses listed in Table 509. For example a high school may have several classrooms that are classified as laboratories or vocational classrooms. These classrooms and labs typically exceed 10 percent of the story that they are located in. There is no guidance in the IBC to direct the user on how to address these situations. By eliminating the 10 percent limitation, the classrooms would still be required to be separated or protected with automatic sprinklers. However, they would not be limited. This would also address the condition where a large campus style project has a building that serves as a central heating plant as well.

Cost Impact: The proposed changes will not increase the cost of construction.

G131-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

509.3-G-THOMAS.doc

G132 – 12
509.3

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

509.3 Area limitations. Incidental uses shall not occupy more than 10 percent of the *building area* ~~of the *story*~~ in which they are located.

Reason: In the last code cycle, this provision was added at the Final Action to code change G107-09/10. While it mirrors the requirement for Accessory occupancies, Section 508.2.1, and may have made since at the time, when actually put into practice it creates a problem.

It is not uncommon for high rise buildings to dedicate a full floor, either basement or 5th floor, to mechanical equipment. To expect them to allocate 10% per floor to such incidental uses is impractical.

In such designs, those floors can no longer be considered incidental and require the assignment of an occupancy classification. What is the occupancy classification of a boiler? Is it an F for making hot water or an S for storing hot water? What is the occupancy of refrigeration equipment?

What is the classification of a Group I-3 padded cells when the number of padded cells exceeds the limitation of Incidental Uses? Isn't it still an I-3? Is the 1-hour separation of Table 509 still required between I-3 padded cells exceeding 10% in area and the other I-3 cells on the floor? It would appear that they could use the non-separated mixed use provisions and avoid any separation. In that case, adding more padding eliminates the 1-hour separation.

And once a floor is classified as a Group S-1 or F-1, the building can no longer take the high-rise reduction from IB to IIA of Section 403.2.1.1(2).

Another example of a problem is "Laboratory and vocational shops, not classified as Group H, located in a Group E or I-2 occupancy." If such labs and/or vocational shops cannot be less than 10% of the floor, or with this proposal, 10% of the building, they are no longer an incidental use. They must be classified as something else.

No justification has been presented to show that full floor incidental uses are a problem. It may not be appropriate to limit the area at all, and the entire section should be deleted. However, deleting the "per floor" limitation may solve the problem and still meet the committees concerns of limiting the square footage.

Cost Impact: This code change proposal will not increase the cost of construction.

G132-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

509.3-G-GODWIN

G133 – 12
510.2

Proponent: Marshall Klein, P.E., Marshall A. Klein & Associates, Inc., representing (NMHC) (makleinfpe@comcast.net) and Jason Thompson, P.E., National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours.
2. ~~The building below the *horizontal assembly* is not greater than one *story above grade plane*.~~

(Portions of text not shown remain unchanged)

Reason: (Klein) Item #2 of Section 510.2 is an antiquated section of the Code that was a carryover from the legacy 1997 UBC Section 311.2.2.1, **"Group S, Division 3 with Group A, Division 3; Group B, Group M or R, Division 1 Occupancy above"**. Under this section of the UBC the occupancies permitted below the 3 hour fire rated horizontal separation (i.e. parking garage, B, M and A-3 occupancies) were ***not*** required to be sprinklered. In the 2009 IBC, we revised the requirements under this Section of Code to **require** the building below the 3 hour fire rated horizontal separation to be sprinklered per Section 903.3.1.1 (NFPA 13) (See 2012 IBC Section 510.2(6)). Therefore, to limit the building under Section 510.2 that is of Type 1A Construction Type and sprinklered makes no sense anymore, and limits the use of this section of Code in major urban renewal areas of the US.

From a life safety/fire protection standpoint, permitting the Type 1A portion under the 3 hour horizontal separation to go to any number of stories, is an equal or better type of construction that is permitted by this section of code under Section 510.2(7). Section 510.2(7) permits the building(s) above the Type IA portion to be a maximum height in feet not to exceed the height limits set forth in Section 503 for the "…building having the smaller allowable height as measured from the grade plane…". Therefore, a project built under Section 510.2 can presently have above the Type IA portion an R-2 occupancy, sprinklered per NFPA 13R, 4 story, Type 5A, maximum of 60' above grade plane (or an R-2 occupancy, sprinklered per NFPA 13, 4 story, Type 5A, maximum of 70' above grade plane). However, if Item #2 is deleted, then as the Type IA portion is increased in its number of stories above grade plane, the portion above is still limited by Item #7's height limitation and its "height footprint" is being reduced. The net effect is that because this section of the Code will not permit more stories for the Type IA Construction Type, sprinklered portion of the project, the net effect is the reduction of the height of the portion of the project that is of a lesser construction type that is above the Type IA portion. Therefore, from a life safety/fire protection standpoint, we have an equal or better code requirement that is more flexible to provide for the needs of our urban needs to bring people back into our major cities to live and work.

(Thompson) Section 510.2 of the IBC has requirements to allow buildings with certain occupancies to be constructed with mixed construction types by using what is commonly referred to as pedestal construction where a building of a lesser type of construction is permitted to be built on top of a building of Type IA construction and the different types of construction are allowed to be considered separate buildings. This method of construction is allowed provided specific criteria are met including the installation of a 3 hour horizontal assembly that acts as a de facto "fire wall" separating the two buildings from vertical fire exposure (Item 1) and by limiting the total building height to the maximum height permitted in Table 503 for the lesser construction type (Item 7). However, the present code limits the height of the Type IA portion of the building below the 3 hour horizontal assembly to a single story above grade plane (Item 2).

Type IA is the most stringent construction type in the IBC from a fire resistance and noncombustibility point of view. According to Table 503, except for Group H-1 and H-2 occupancies, all other occupancies in buildings of Type IA construction are permitted to be of unlimited height and area due to the inherent fire safety provided by the most fire resistive construction type. However, Item 2 in Section 510.2 limits the Type IA building serving as the base of the pedestal construction to one story in height. This code change proposes to delete the one story limitation for the Type IA building portion of the pedestal construction. This will allow the Type IA building serving as the base of the pedestal construction to be multiple stories while still maintaining the total building height limit in Item 7 of Section 510.2 which is based on the construction type of the lesser type of construction built on top of the Type IA pedestal. This makes good sense since the more stories of Type IA construction allowed above the grade plane, the less potential stories of combustible construction with less fire resistance there will be in the building above.

Cost Impact: (Klein) The construction will cost more because of the additional cost of Type IA construction, but without the additional story or stories of Type IA podium for commercial development the project would not be cost effective to build to promote urban development.

(Thompson) This will not increase the cost of construction.

G133-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.2-G-KLEIN-COMBINED.doc

G134 – 12
510.2

Proponent: C. Ray Allshouse AIA, CBO, City of Shoreline, WA, representing the Washington Association of Building Officials Technical Code Development Committee (rallshouse@shorelinewa.gov)

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours.
2. The building below the *horizontal assembly* is not greater than one *story above grade plane*.
3. The building below the *horizontal assembly* is of Type IA construction.
4. *Shaft*, *stairway*, *ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.5.

    Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716.5, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided:

    1. The building above the *horizontal assembly* is not required to be of Type I construction;
    2. The enclosure connects fewer than four *stories*; and
    3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

5. The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occupancy uses, each with an *occupant load* of less 300, or Group B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any ~~of the following occupancies:~~ <u>occupancy allowed by this code except Group H.</u>
    ~~6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;~~
    ~~6.2. Multiple Group A, each with an *occupant load* of less than 300;~~
    ~~6.3. Group B;~~
    ~~6.4. Group M;~~
    ~~6.5. Group R; and~~
    ~~6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).~~
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*.

Reason: Current code language unnecessarily limits occupancy types under the building separation allowances in the case of horizontal separation assemblies when compared with vertical assemblies. Since a building is considered separate and distinct provided that all seven conditions listed in Section 510.2 are met, noting that these conditions specifically include Type IA construction below the 3-hour fire resistance rated horizontal assembly and the maximum building height shall not exceed Section 503 limits above the grade plane, why does the code also restrict Group E, I and F occupancies from consideration? Such occupancies could exist immediately next to these buildings limited by precisely the same height limitations with a less restrictive fire separation rating.

Cost Impact: The code change proposal will not increase the cost of construction.

G134-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.2-G-ALLSHOUSE

G135 – 12
510.2

Proponent: Stephen A. McGlocklin representing the City of Shoreline, WA (smcglocklin@shorelinewa.gov)

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours.
2. The building below the *horizontal assembly* is not greater than one *story above grade plane*.
3. The building below the *horizontal assembly* is of Type IA construction.
4. *Shaft*, *stairway*, *ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 716.5.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716.5, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided:

   1. The building above the *horizontal assembly* is not required to be of Type I construction;
   2. The enclosure connects fewer than four *stories*; and
   3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

5. The building or buildings above the *horizontal assembly* shall be permitted to have ~~multiple~~ Group A ~~occupancy uses, each with an *occupant load* of less 300, or Group~~ , B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:
   6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;
   6.2. ~~Multiple~~ Group A~~, each with an *occupant load* of less than 300~~;
   6.3. Group B;
   6.4. Group M;
   6.5. Group R; and
   6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*.

Reason: Current code language unnecessarily limits Group A occupancies under the building separation allowances involving horizontal assemblies. If there is a legitimate reason to limit the assembly occupant load above or below the horizontal assembly, one could argue that the current code language is flawed as it allows for multiple Group A occupancies with individual occupant loads of less than 300. However, given that it appears the intent of the code is to not restrict this total occupant load, the individual limitation for each Group A occupancy is not a logical restriction and should therefore be removed.

Cost Impact: The code change proposal will not increase the cost of construction.

G135-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.2-G-MCGLOCKLIN

G136 – 12
510.2

Proponent: Joe Nebbia and Mark Nowak, Steel Framing Alliance

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:

1. through 6. *(no change)*
7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*. <u>Additionally, when Type V buildings are constructed above the horizontal separation, the combined maximum number of stories measured from the grade plane shall not exceed the limits set forth in Section 503 for the building having the smaller number of stories.</u>

Reason: Condition 7 as it currently reads is intended to limit heights of buildings consistent with fire safety concerns. It is particularly important for unprotected (Type V) combustible construction to not exceed building heights from a fire fighting capability perspective but also to limit the occupants at risk in this type of construction. This proposal limits the total number of stories from grade plane (and thus occupants) when Type V construction is used above a horizontal separation to the same limits originally intended in Table 503 for Type V construction. It will prevent a frequent misapplication of the code that results in combustible materials being used at heights that have not been shown or viewed to be safe from a fire protection perspective.

The horizontal separation height increase allowance is being misapplied to allow combustible construction with buildings as high as 5 stories (e.g., 4 wood framed stories on top of a concrete, steel, or masonry story), beyond the height traditionally viewed as safe. This proposal will eliminate this loophole in the code.

Increasing the height or allowing more stories when using combustible materials increases the risk, independent of the presence of a horizontal building assembly. This proposal is consistent with the defend-in-place approach of protecting occupants. According to the NFPA 2008 Fire Protection Handbook (Section 20), there are multiple components to the defend-in-place approach including but not limited to compartmentalization, sprinklers, and use of fire-resistive materials. The principle cannot depend on any one safeguard. The Handbook frequently references the need for noncombustible materials through multiple sections discussing the defend-in-place principles.

This proposal is also consistent with the fire safety approach that strives to limit the reliance on vertical evacuation. Introducing additional sets of stairs into the emergency egress equation is particularly risky for occupancies where occupants are not familiar with the building or require assistance with evacuation.

Although important for all buildings, it particularly important to correct this deficiency in the code for buildings that are occupied as living quarters or for medical or other care facilities either on a permanent or temporary basis. Yet, designers of residential buildings are most often the ones that take advantage of the horizontal separation to build higher with combustible materials. In fact, there are websites and industry-sponsored seminars that offer assistance to designers showing how to build taller with combustible materials specifically citing this section of the code as the rationale.

Cost Impact: This code change proposal will increase the cost of construction. Cost impacts will be limited to a small number of Type V buildings.

G136-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.2 #1-G-NEBBIA-NOWAK.doc

G137 – 12
510.2

Proponent: Joe Nebbia and Mark Nowak, Steel Framing Alliance

Revise as follows:

510.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where all of the following conditions are met:

1. through 7. *(no change)*
8. For Type V buildings with combustible framing members above the horizontal separation, all automatic fire sprinklers required by this code shall be in place and operable prior to continuing construction on any part of the building exceeding three stories above grade plane. Combustible framing members shall be protected by exterior and interior finishes or coverings permitted by this code before the total height of the building can exceed 3 stories above grade plane and before a certificate of occupancy is issued for any part of the building.

Reason: This proposal is designed to reduce the fire risk in Type V buildings to adjacent buildings and property, and reduce the risk of high intensity fires that require significant firefighting resources, leaving other areas in the community without adequate protection. Further, it will reduce the fire risk to occupants in buildings by prohibiting occupancy before all fire resistance and suppression systems are in place and operational in the building. It specifically addresses Type V buildings constructed with combustible materials that are exposed prior to and after construction, when such buildings exceed three stories in height.

Prompted by a series of serious fires in residential buildings, the London (UK) Assembly in 2010 called for an inquiry to examine fire safety issues. Among the findings by the examining commission was the determination that wood framing carries a high fire risk throughout most of the construction process. The risk extends beyond the building to include adjacent and neighboring buildings.

According to the report titled **Fire safety in London, Fire risks in London's tall and timber framed buildings,** "The effects of fire on large timber frame construction sites are significantly greater due to the large amount of exposed wood, the rapid spread and the radiated heat that can impact on surrounding buildings. All this can affect the ability of fire fighters to tackle the blaze."

The report further states "Fire risks in timber framed buildings are greatest during the construction phase when the fire resistant elements such as internal fire separating walls, protective linings and claddings and fire stopping in cavities are incomplete."

Insurance issues are also raised in the report, citing a quote by Zurich Insurance that timber framed buildings under construction "offer limited resistance until virtually the final stages of construction... This contrasts significantly to that provided in a more traditionally constructed or fire resisting construction system where the applied protection measures offer an immediate benefit in being applied to a noncombustible and generally more stable building elements"

Regarding the not uncommon practice of buildings being partially occupied, the report states that "timber frame buildings are not safe for occupation where there is still construction ongoing on site. Incomplete fire compartmentalization would make this extremely dangerous as fires can spread quickly to the occupied parts of the building and more so than "conventional" buildings." A significant recommendation in the report is that local authorities "do not permit the partial or full occupation of timber framed developments until the whole development is complete and signed off as complying with the approved building regulations."

The London report also cites several examples of the fires that initiated their study including the following that demonstrates the risk to adjacent properties and occupants:

> *In the afternoon of Wednesday 12 July 2006 there was a serious fire at a timber framed development situated between Aerodrome Road and Grahame Park Way in Colindale, London NW9. In response to the fire about 100 fire fighters spent five hours at the scene, during which time a number of neighboring premises, including Colindale Police Station and Hendon police college on opposite sides of the site, were evacuated and a stretch of the nearby A41 through Hendon was closed until 21:30 hours. Some 2000 local residents were evacuated from their homes. An adjoining building occupied by Middlesex University as halls of residence, was severely damage as a result of the fire spreading. Radiated heat also severely damaged 30 cars parked in the roads nearby.*

A copy of the London Assembly report is available at http://www.london.gov.uk/who-runs-london/the-london-assembly/publications/housing-planning/fire-safety-in-london

The risk of exposed lumber in taller buildings is not limited to London. In fact, the first wood mid-rise building in British Columbia burned to the ground before it was finished in the spring of 2011. Because it was under construction, the building had no systems in place and the wood framing was exposed directly to the flames. When rebuilt, the project will follow fire department recommendations to include earlier installation and activation of sprinklers and fire doors, among other recommendations. This incident like the similar fires in London, stresses the importance of limiting the heights at which unprotected combustible construction should be permitted. Because the intensity of the fire is so much greater than other fires due to the exposed wood, these fires require substantial firefighting capabilities and often leave little to no protection for other parts of the city during the fire. The NFPA Fire Protection Handbook (2008 version, Page 11-52) also cites the vulnerability of buildings under construction and their threat to adjacent buildings. The Handbook presents a case study of a fire in a five story, wood framed building. Following is an excerpt:

The fire completely destroyed the building under construction and spread fire to many other buildings in the neighborhood. A total of over 20 buildings and 20 vehicles were damaged by the fire. Windows in a brick building across the street and at least 100 feet away were broken from the fire.

Further, the same case study states: *It (the fire) also emphasizes the importance of expediting the installation of sprinklers and the vulnerability of combustible construction materials before they are sheathed.*

Currently, Table 503 limits Type V construction to at most 3 stories except for low hazard storage (S-2), before any modifications to the allowable height are applied. This proposal, if approved, will require the building to be fully protected as required for a finished building before applying sprinkler or horizontal separations provisions of the code to increase building height. It will also remove an important oversight in the code by requiring combustible materials to be covered before occupancy of any part of the building.

Cost Impact: This code change proposal will increase the cost of construction. Cost impacts will be limited to a small number of Type V buildings.

G137-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.2 #2-G-NEBBIA-NOWAK.doc

G138 – 12
510.8

Proponent: Jason Thompson, P.E., National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

510.8 Group B ~~or~~ and M buildings with Group S-2 open parking garage above. Group B ~~or~~ and M occupancies located ~~not higher than the first *story above grade plane*~~ below a Group S-2 open parking garage of a lesser type of construction shall be considered as a separate and distinct building from the Group S-2 open parking garage for the purpose of determining the type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 2 hours.
2. The occupancies in the building below the *horizontal assembly* are limited to Groups B and M.
3. The occupancy above the *horizontal assembly* is limited to a Group S-2 *open parking garage*.
4. The building below the horizontal assembly is of Type IA construction.

   Exception: The building below the *horizontal assembly* ~~is~~ shall be permitted to be of Type IB or II construction, but not less than the type of construction required for the Group S-2 *open parking garage* above, where the building below is not greater than one story in height above grade plane.

5. through 7. *(no change)*

Reason: Section 510.8 of the IBC has requirements that allow buildings with certain occupancies to be constructed with mixed construction types by using what is commonly referred to as pedestal construction where a building of a lesser type of construction is permitted to be built on top of a building of Type I or II construction and the different types of construction are allowed to be considered separate buildings. This method of construction is allowed provided specific criteria are met including the installation of a 2 hour horizontal assembly that acts as a de facto "fire wall" separating the two buildings from vertical fire exposure (Item 1) and by limiting the total building height to the maximum height permitted in Table 503 for the lesser construction type (Item 6). However, the present code limits the height of the Type I or II portion of the building below the 2 hour horizontal assembly to a single story above grade plane.

This code change proposes to delete the one story limitation where the lower building portion of the pedestal construction is of Type IA construction. This will allow the Type IA building serving as the base of the pedestal construction to be multiple stories in height while still maintaining the total building height limit in Item 6 of Section 510.8 which is based on the construction type of the lesser type of construction built on top of the Type IA pedestal. Type IA is the most stringent construction type in the IBC from a fire resistance and noncombustibility point of view. According to Table 503, except for Group H-1 and H-2 occupancies, all other occupancies in buildings of Type IA construction are permitted to be of unlimited height and area due to the inherent fire safety provided by the most fire resistive construction type. This makes good sense since the more stories of Type IA construction allowed above the grade plane, the less stories of potentially combustible construction and less fire resistance there will be in the building above.

This code change to Section 510.8 is very similar to another code change we have proposed to Section 510.2 Horizontal Building Separation Allowance for pedestal buildings with high fire resistive construction for the lower building of the pedestal.

Cost Impact: The code change will not increase the cost of construction.

G138-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.8-G-THOMPSON.doc

G139 – 12
Table 601

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., (tcrimi@sympatico.ca), representing North American Insulation Manufacturers Association (NAIMA)

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of ~~structural~~ <u>secondary</u> members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members. <u>Fire protection is still required for structural members forming part of the *primary structural frame.*</u>

(Portions of Table and footnotes not shown remain unchanged)

Reason: Table 601 Fire Resistance Rating Requirements for Building Elements specifies the hourly fire resistive requirements for building elements such as structural framing, floor and roof construction, and walls and partitions. Note b of Table 601 applies to the construction of the roof and related secondary members in all types of construction. It allows these secondary elements to be exempted from being protected construction when all parts of the roof construction are more than 20 feet (6096 mm) above any floor below. Previous editions of the IBC more clearly differentiated between structural members and the structural frame. The 2003 and 2006 IBC specified that the structural frame is considered to be the columns and the girders, beams, trusses, and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns were intended to be considered secondary members and not part of the structural frame.

The proposed addition clarifies that this exception applies to the structural members, but does not apply to all parts of the structural frame. This distinction is frequently misinterpreted in the field and many times the structural frame is also allowed to be eliminated. The 2009 IBC Commentary clearly confirms that this only applies to the secondary members of the structure and not to primary structural frame located within the roof or at this roof level, as shown in Figure 601(1) of the 2009 International Building Code, Code and Commentary, Volume 1, page 6-3. This alternative is applicable for all occupancy classifications except Groups F-1, H, M and S-1.

Figure 601(2) of the 2009 International Building Code, Code and Commentary, Volume 1, page 6-4.shows an example where a mezzanine reduces the clearance to the roof to less than 20 feet (6096 mm) for a portion of the total roof. The Code Commentary clearly illustrates that designs similar to Figure 601(2) do not comply with note b, and elimination of fire-resistance is not allowed for any of the roof in these cases.

According to the 2012 IBC, by definition, the primary structural frame includes the columns; structural members having direct connections to the columns, including girders, beams, trusses and spandrels; members of the floor construction and roof construction having direct connections to the columns; and bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity loads.

Cost Impact: This proposal does not increase the cost of construction.

G139-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T601-G-CRIMI.doc

G140 – 12
Table 601

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering, (al.godwin@aon.com)

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A~~[d]~~	B	A~~[d]~~	B	HT	A~~[d]~~	B
Primary structural frame[g] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls Exterior[f, g] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 2 1	 2 0	 2 1/HT	 1 1	 0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1½[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

~~d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.~~

(Portions of text not shown remain unchanged)

Reason: In order to take advantage of this footnote, the sprinkler system must be "not otherwise required." The question is "required by what section?"

Obviously, it is known that if you take extra square footage or extra height and stories, the 1-hour tradeoff is not permitted.

And, it can be assumed that if the sprinkler system is installed to comply with the Fire Area provisions of Section 903, the system is required.

However, take note of Section 901.2 which states "Any fire protection system for which an exception or reduction to the provisions of this code has been granted shall be considered to be a required system." Thus, if any of the following items are applied, the system is a required system:

Flame spread reduction
Extra travel distance
Extra common path of egress travel
Corridor fire rating reduction
Dead end corridor extensions
Open stairs in sprinklered two story buildings
Etc.

The IBC commentary, Section 901.2, states:

"For example, a typical small office building may not require an automatic sprinkler system solely due to its Group B occupancy classification; however, if an exit access corridor fire-resistance-rating reduction is taken in accordance with Table 1018.1 for buildings equipped throughout with an NFPA 13 sprinkler system, that sprinkler system would be considered a required system."

When looking at Table 503, how many buildings that are large enough to be a Type VA, IIIA or IIA and are not already required to be sprinklered by another provision of the code. Group B occupancies are the most obvious exempted occupancy.

And, if there is a building that is a VA, IIIA or IIA without being sprinklered, who is going to sprinkler a building and not take a sprinkler reduction as listed above.

Allowing this footnote to continue to exist opens the door to misuse. Sprinkler exceptions and reductions are going to be taken along with the 1-hour reduction, in violation of the provision. If not now, perhaps 5 years from now when the jurisdiction forgets that

a 1-hour reduction was granted.
There is no need to allow this footnote to continue to exist.

Cost Impact: This code change proposal will not increase the cost of construction since those projects that are taking one-hour reduction along with non-allowed trade-offs are non-compliant anyway.

G140-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T601-G-GODWIN.doc

G141 – 12
602.4, Table 602.4

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

602.4 Type IV. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. *Fire-retardant-treated wood* framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less. Minimum solid sawn nominal dimensions are required for structures built using Type IV construction (HT). For glued laminated members and Structural Composite Lumber (SCL) members, the equivalent net finished width and depths corresponding to the minimum nominal width and depths of solid sawn lumber are required as specified in Table 602.4.

TABLE 602.4
WOOD MEMBER SIZE EQUIVALENCIES

MINIMUM NOMINAL SOLID SAWN SIZE		MINIMUM GLUED-LAMINATED NET SIZE		MINIMUM STRUCTURAL COMPOSITE LUMBER NET SIZE	
Width, inch	Depth, inch	Width, inch	Depth, inch	Width, inch	Depth, inch
8	8	6¾	8¼	7	7½
6	10	5	10½	5¼	9½
6	8	5	8¼	5¼	7½
6	6	5	6	5¼	5½
4	6	3	6⅞	3½	5½

Reason: Along with large solid-sawn and glued-laminated timbers, Structural Composite Lumber (SCL) can be produced in sizes necessary to qualify for Heavy Timber construction. Net dimensions of typical SCL members are similar to the net dimensions of nominal solid sawn timbers; however, the minimum width dimensions are slightly less than solid sawn timber widths and slightly greater than the glued-laminated timber net widths. In order to estimate equivalent cross-sectional dimensions, the initial section properties of the solid-sawn and glued-laminated timbers were compared with initial section properties of SCL. Starting with common SCL net widths between solid-sawn and glued-laminated timber net widths, minimum net depths were estimated for each nominal heavy timber size to provide similar net section properties. The resulting net dimensions were then incorporated into Table 602.4.

Cost Impact: The code change proposal will not increase the cost of construction.

G141-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.4 #1-G-FRANCIS

G142 – 12

PART 1 – IBC GENERAL
602.4, 602.4.1 (NEW), 602.4.2 (NEW), 602.4.4, 602.4.6.2 (NEW), 602.4.5, 602.4.6, 602.4.8.1, 602.4.8.2 (NEW),
PART 2 – IBC STRUCTURAL
202, 2303.1.4 (NEW), Chapter 35

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

THIS IS A 2 PART CODE CHANGE. THE FIRST PART WILL BE HEARD BY THE IBC GENERAL COMMITTEE AND THE SECOND BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

PART I – IBC GENERAL

Revise as follows:

602.4 Type IV. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. ~~Fire retardant treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less.~~ Exterior walls complying with Section 602.4.1 or 602.4.2 shall also be permitted. Minimum solid sawn nominal dimensions are required for structures built using Type IV construction (HT). For glued-laminated members the equivalent net finished width and depths corresponding to the minimum nominal width and depths of solid sawn lumber are required as specified in Table 602.4. *Cross laminated timber* (CLT) dimensions used in this section are actual dimensions.

602.4.1 *Fire-retardant-treated wood* framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less.

602.4.2 *Cross-laminated timber* complying with Section 2303.1.4 shall be permitted within exterior wall assemblies with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected *by (1) fire retardant treated wood* sheathing complying with 2303.2 and not less than 15/32 inch thick; or (2) *gypsum board* not less than ½ inch thick; or (3) a noncombustible material.

~~602.4.1~~ **602.4.3 Columns.** Wood columns shall be sawn or glued laminated and shall be not less than 8 inches (203 mm), nominal, in any dimension where supporting floor loads and not less than 6 inches (152 mm) nominal in width and not less than 8 inches (203 mm) nominal in depth where supporting roof and ceiling loads only. Columns shall be continuous or superimposed and connected in an approved manner.

~~602.4.2~~ **602.4.4 Floor framing**. Wood beams and girders shall be of sawn, or glued-laminated *timber* and shall be not less than 6 inches (152 mm) nominal in width and not less than 10 inches (254 mm) nominal in depth. Framed sawn, glued-laminated *timber* arches, which spring from the floor line and support floor loads, shall be not less than 8 inches (203 mm) nominal in any dimension. Framed timber trusses supporting floor loads shall have members of not less than 8 inches (203 mm) nominal in any dimension.

~~602.4.3~~ **602.4.5 Roof framing**. Wood-frame or glued-laminated arches for roof construction, which spring from the floor line or from grade and do not support floor loads, shall have members not less than 6 inches (152 mm) nominal in width and have not less than 8 inches (203 mm) nominal in depth for the lower half of the height and not less than 6 inches (152 mm) nominal in depth for the upper half. Framed or glued-laminated arches for roof construction that spring from the top of walls or wall abutments, framed timber trusses and other roof framing, which do not support floor loads, shall have members not less than 4 inches (102 mm) nominal in width and not less than 6 inches (152 mm) nominal in depth. Spaced members shall be permitted to be composed of two or more pieces not less than 3 inches (76 mm) nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2 inches (51 mm) nominal in thickness secured to the underside of the members. Splice plates shall be not less than 3 inches (76 mm) nominal in thickness. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches (76 mm) nominal in width.

~~602.4.4~~ 602.4.6 Floors. Floors shall be without concealed spaces. Wood floors shall be constructed in accordance with 602.4.6.1 or 602.4.6.2.

602.4.6.1 Sawn or glued-laminated planks. ~~of s~~Sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or diagonally, or 0.5-inch (12.7 mm) particleboard or planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring or 15/32-inch (12 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard. The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than 0.5 inch (12.7 mm) to walls. Such 0.5-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbelling of masonry walls under the floor shall be permitted to be used in place of molding.

602.4.6.2 CLT. *Cross laminated timber* shall be not less than 4 inches (102 mm) in thickness. It shall be continuous from support to support and mechanically fastened to one another. *Cross laminated timber* shall be permitted to be connected to walls without a shrinkage gap providing swelling or shrinking is considered in the design. Corbelling of masonry walls under the floor shall be permitted to be used.

~~602.4.5~~ 602.4.7 Roofs. Roofs shall be without concealed spaces and wood roof decks shall be sawn or glued laminated, splined or tongue-and-groove plank, not less than 2 inches (51 mm) nominal in thickness~~,~~; 11/8-inch-thick (32 mm) wood structural panel (exterior glue)~~, or of~~; planks not less than 3 inches (76 mm) nominal in width, set on edge close together and laid as required for floors~~.~~; or of cross laminated timber. Other types of decking shall be permitted to be used if providing equivalent fire resistance and structural properties

Cross laminated timber roofs shall be not less than 3 inch nominal in thickness and shall be continuous from support to support and mechanically fastened to one another.

~~602.4.6~~ 602.4.8 Partitions and Walls. Partitions and walls shall comply with 602.4.8.1 or 602.4.8.2.

602.4.8.1 Interior Walls and Partitions. Interior walls and partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of 1-hour fire-resistance-rated construction.

602.4.8.2 Exterior walls. All exterior walls shall be of one of the following:

1. Noncombustible materials; or
2. Not less than 6 inches in thickness and constructed of one of the following:
   2.1 *Fire retardant treated wood* in accordance with 2303.2 and complying with 602.4.1 or
   2.2. *Cross laminated timber* complying with 602.4.2.

~~602.4.7~~ 602.4.9 Exterior Structural Members. Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes shall be permitted to be used externally.

PART II- IBC STRUCTURAL

Add new text as follows:

2303.1.4 Structural glued cross laminated timber. Cross-laminated timbers shall be manufactured and identified as required in ANSI/APA PRG 320-2011.

Add new standard to Chapter 35 as follows:

ANSI or APA
ANSI/APA PRG 320-2011 Standard for Performance-Rated Cross-Laminated Timber

Add new definition as follows:

CROSS-LAMINATED TIMBER. A prefabricated engineered wood product consisting of at least three layers of solid-sawn lumber or *structural composite lumber* where the adjacent layers are cross-oriented and bonded with structural adhesive to form a solid wood element.

Reason: Cross-laminated timber (CLT) is a new technology developed in Europe. It is generally analogous to large section members currently associated with heavy timber in the current code. Its fire performance is most like that of glued-laminated beams, or glu-lams, in traditional Type IV (heavy timber) construction. Therefore it is proposed that the CLT be included in Type IV. To properly accomplish this, this proposal adds a definition of CLT, adds a consensus-developed product standard and then modifies the text of Type IV to accommodate CLT.

In Item #1, the existing language is maintained but FRTW, currently allowed in walls of Type IV, is pulled out into a subset of nontraditional material permitted to be used in Type IV. CLT is then added as the second subset. This makes it clear that this mode of construction performs like Heavy Timber but is constructed with different techniques. Walls are more like “tilt-up slabs” than HT beams but their fire performance is very similar to HT. Floors are more like slabs but again, their fire performance is similar to HT.

No changes are needed to the sections on columns, floor framing or roof framing because CLT is neither used as a “column” nor a "framing material". Cross-laminated timber is a large, thick panel composed of crosswise layers of dimension lumber bound with a structural adhesive.

In Section 602.4.4-Floors, the existing language is pulled down into a subparagraph and is unchanged. CLT floors are slightly different than HT so it is put into a second subparagraph with its own requirements. Among the differences is thickness (CLT=4 inches; HT=3 inches topped with a sheathing). Finally, the section is renumbered to accommodate the inserted subsections on general requirements.

In Section 602.4.5-Roofs, the existing language is pulled down, unchanged, into a subparagraph. CLT is again included as a subparagraph. Again the numbering is changed.

In Section 602.4.6-floors, CLT is added as an explicitly permitted form of floor decking. Traditional HT floor decks are 3” or 4” thick planks with various sheathings. Unlike the traditional plank decking, the CLT alternate has no joints to protect. Therefore no sheathing is required on top of the CLT. The structure of the section does not, however, prohibit the use of sheathing on top of a CLT floor deck.

In Section 602.4.7-roofs, CLT is added as an explicitly permitted form of roof decking.

In Section 602.4.8-walls, CLT is added as an acceptable wall system. For interior walls, it is already compliant as an element of solid wood construction meeting the traditional minimum dimensions. This section was modified to break out exterior walls separately so as to correlate with the base paragraph, 602.4 and its CLT subsection, 602.4.2. This eliminates any confusion which might arise between the two sections. By separating the interior and exterior walls, the new minimum wall thickness requirement associated with CLT may be interpreted to apply to all exterior wall construction, including traditional construction. However, it is observed that all common forms of exterior wall construction of Type IV would easily comply with this requirement.

The remaining items are necessary to include the product standard for CLT and a definition for the product. These items form the basis for the inclusion in Chapter 6 and give clarity to this new type of wood construction.

More information on the cross-laminated timber product can be found at our website, www.AWC.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/APA PRG 320-2011 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G142-12

PART I - IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.4 #2-G-FRANCIS

G143 – 12
602.4.4

Proponent: Sam Francis, American Wood Council (sfrancis@awc.org)

Revise as follows:

602.4.4 Floors. Floors shall be without concealed spaces. Wood floors shall be of:

1. Sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or diagonally, 15/32-inch (12 mm) wood structural panel, or 0.5-inch (12.7 mm) particleboard; or

2. Planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring, ~~or~~ 15/32-inch (12 mm) wood structural panel, or 0.5-inch (12.7 mm) particleboard.

The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than 0.5 inch (12.7 mm) to walls. Such 0.5-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbelling of masonry walls under the floor shall be permitted to be used in place of molding.

Reason: This section is awkwardly worded with multiple requirements buried in a single paragraph. The revised formatting is user friendly and improves the structure of the provisions.

The technical change inserting 15/32-inch wood structural panel into the first option actually is how this requirement appeared in the 1996 BOCA National Building Code, the 1994 ICBO Uniform Building Code and the 1994 SBCCI Standard Building Code. Given that all three legacy codes had this provision, it seems likely that it was inadvertently omitted in the 2000 IBC.

This does nothing to change the long standing practice of Heavy Timber construction but it cleans up the text so that newer users can make sense of the options afforded herein.

Cost Impact: The code change proposal will not increase the cost of construction.

G143-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.4.4-G-FRANCIS

G144 – 12
602.4.4

Proponent: Edward I. Keith, APA - The Engineered Wood Association (ed.keith@apawood.org)

Delete and substitute as follows:

602.4.4 Floors. Wood floors shall be without concealed spaces, except that building service equipment may be enclosed, provided the enclosed space is fire blocked or protected by other acceptable means. The subfloor shall be either:

1. ~~Wood floors shall be of~~ Sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness ~~covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or diagonally, or 0.5-inch (12.7 mm) particleboard~~, or,
2. Sawn planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked ~~and covered with 1-inch (25 mm) nominal dimension flooring or 15/32-inch (12 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard.~~

The subfloor ~~lumber~~ shall be laid so that no continuous line of joints will occur except at points of support. The subfloor shall be covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring laid crosswise or diagonally, 15/32-inch (12 mm) wood structural panel, or 1/2-inch (12.7 mm) particleboard. Floors shall not extend closer than 0.5 inch (12.7 mm) to walls. Such 0.5-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbeling of masonry walls under the floor shall be permitted to be used in place of molding.

Reason: The original section is very difficult to understand as it was written. Two separate assemblies were discussed together in the same paragraph with some descriptions applying to one and some to the other. The proposal does two things. The first is to identify the two systems separately and place the other descriptive elements common to both in a separate paragraph.
The proposal also adds the language, "except that building service equipment may be enclosed, provided the enclosed space is fire blocked or protected by other acceptable means". This language was first added to the description of heavy timber construction in 2004 in AWC's Wood Construction Data: Heavy Timber Construction (WCD 5), available on AWC's website www.awc.org. This provides guidance for the handling of building service equipment that is inevitably there, but not covered currently in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

G144-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.4.4-G-KEITH.doc

G145 – 12
603.1

Proponent: David Scott, Target (David.Scott@target.com)

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. through 25. *(no change)*
26. Wall construction of freezers and coolers of less than 1000 sq. ft. in size, lined on both sides with non combustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1

Reason: Item 6 allows for combustible materials such as doors, door frames, window sashes and frames. Item 11 allows partitions of wood panels or similar light construction up to 6 feet in height. In addition, freezer and cooler walls would need to meet finish requirements of section 803 and 2603.

Cost Impact: The code change proposal will not increase the cost of construction.

G145-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.1-G-SCOTT.doc

G146 – 12
1203.2

Proponent: Michael D. Fischer, Kellen Company, representing Asphalt Roofing Manufacturers Association

Revise as follows:

1203.2 Attic spaces. Enclosed *attics* and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilation openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. An airspace of not less than 1 inch (25 mm) shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150th of the area of the space ventilated.

Exceptions:

1. The net free cross-ventilation area shall be permitted to be reduced to 1/300 provided ~~that not less than 50 percent and not more than 80 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required *ventilation* provided by eave or cornice vents.~~ Both of the following conditions are met:
   1.1. In Climate Zones 6, 7 and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.
   1.2 At least 40 percent and not more than 50 percent of the required venting area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the *ventilation* provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

~~2. The net free cross-ventilation area shall be permitted to be reduced to 1/300 where a Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling.~~

~~3~~2. ~~*Attic*~~ Ventilation of attic spaces under low slope roof assemblies shall not be required when determined not necessary by the *building official* due to atmospheric or climatic conditions.

Reason: There have been numerous changes to the attic ventilation requirements of the IBC and IRC during the past few code cycles. This proposal is offered to provide consistency with the ventilation requirements between the IBC and IRC and provide clarity regarding the placement of attic ventilators. Additionally, the added exception for local conditions was submitted to manage low-slope design issues; this proposal limits the use of that exception to such roof assemblies.

Cost Impact: This proposal will not raise the cost of construction.

G146-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.2-G-LSTIBUREK.doc

G147 – 12
1203.2

Proponent: Joseph Lstiburek, Building Science Corporation, representing self

Revise as follows:

1203.2 Attic spaces. Enclosed *attics* and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilation openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. An airspace of not less than 1 inch (25 mm) shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150th of the area of the space ventilated.

Exceptions:

1. The net free cross-ventilation area shall be permitted to be reduced to 1/300 provided ~~that not less than 50 percent and not more than 80 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required *ventilation* provided by eave or cornice vents.~~ Both of the following conditions are met:
   1.1. In Climate Zones 6, 7 and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.
   1.2 At least 40 percent and not more than 50 percent of the required venting area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the *ventilation* provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.
2. ~~The net free cross-ventilation area shall be permitted to be reduced to 1/300 where a Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling.~~

~~3~~2. *Attic* ventilation shall not be required when determined not necessary by the *building official* due to atmospheric or climatic conditions.

Reason: This proposed language aligns the IBC with IRC R806.2. The current IBC vapor retarder language is incorrect as it violates the applicable physics in hot climates and needs to be changed. Finally, the current language regarding a 50 percent and 80 percent split between upper and lower vents violates the applicable physics and can lead to attic ventilation make up air being drawn from the building rather than from the eave or cornice vents.

Cost Impact: This proposal will not raise the cost of construction.

G147-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.2-G-LSTIBUREK.doc

G148 – 12
1203.2.1

Proponent: Steven R. Winkel, The Preview Group, Inc., representing The American Institute of Architects (swinkel@preview-group.com)

Revise as follows:

1203.2 Attic Spaces. Attic spaces shall comply with this section.

1203.2.1 Openings into attic. Exterior openings into the *attic* space of any building intended for human occupancy shall be protected to prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. Openings for ventilation having a least dimension of not less than 1/16 inch (1.6 mm) and not more than 1/4 inch (6.4 mm) shall be permitted. Openings for ventilation having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of not less than 1/16 inch (1.6 mm) and not more than 1/4 inch (6.4 mm). Where combustion air is obtained from an *attic* area, it shall be in accordance with Chapter 7 of the *International Mechanical Code*.

~~1203.2~~ 1203.2.2 Vented attic spaces. Enclosed *attics* and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilation openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. An airspace of not less than 1 inch (25 mm) shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150th of the area of the space ventilated.

Exceptions:

1. The net free cross-ventilation area shall be permitted to be reduced to 1/300 provided that not less than 50 percent and not more than 80 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required *ventilation* provided by eave or cornice vents.
2 The net free cross-ventilation area shall be permitted to be reduced to 1/300 where a Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling.
3. *Attic* ventilation shall not be required when determined not necessary by the *building*

1203.2.3 Unvented attic and unvented enclosed rafter assemblies. Unvented *attic* assemblies where spaces between the ceiling joists of the top *story* and the roof rafters, and unvented enclosed rafter assemblies where spaces between ceilings that are applied directly to the underside of roof framing members/rafters and the structural roof sheathing at the top of the roof framing members/rafters, shall be permitted where all the following conditions are met:

1. The unvented *attic* space is completely contained within the *building thermal envelope.*
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed rafter assembly.
3. Where wood shingles or shakes are used, a minimum 1/4- inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder, or shall have a Class III vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Either Items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
   5.1. *Air-impermeable insulation* only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.

5.2. Air-permeable insulation only. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified in Table 1203.2.1 for condensation control.

5.3. Air-impermeable and air-permeable insulation. The *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table 1203.2.1 for condensation control. The air-permeable insulation shall be installed directly under the *air-impermeable insulation.*

5.4. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

TABLE 1203.2.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE[a]	MINIMUM RIGID BOARD ON AIR-IMPERMEABLE INSULATION R-VALUE
2A and 3B tile roof only	0 (none required)
1 ,2A, 2B, 3A, 3B, 3C	R-5
4C	R-10
4A. 4B	R-15
5	R-20
6	R-25
7	R-30
8	R-35

a. Climate zones per the *International Energy Conservation Code*

Reason: There is often confusion in dealing with ventilation of flat roofs that cannot readily meet the ventilation contained in the current attic ventilation provisions of 1203.2. This code change inserts language from the 2012 IRC regarding unvented attics into the IBC. The types of buildings where these requirements are applied under the IBC are very similar to residential light frame construction so this is not a stretch to apply IRC provisions in the IBC. The new provisions are taken directly from the IRC. They allow for unvented attic and rafter details to be used when a specific set of vapor retarder and insulation conditions are met. There are no technical revisions to the existing language in 1203.2.2 other than re-titling it as "Vented Attic Spaces and renumbering it.

The relocation of the attic opening protection provisions from 1203.2.1 to the front of the section is done to further harmonize the IBC provisions with those in the IRC. There are no changes in the text of 1203.2.1, it is merely relocated.

Cost Impact: The code change proposal will slightly increase the cost of construction where insulation is added for unvented attic construction.

G148-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.2.1-G-WINKEL.doc

G149 – 12
202, 1203.2, 1203.3 (NEW), Table 1203.2 (NEW)

Proponent: Joseph Lstiburek, Building Science Corporation, representing self (joe@buildingscinece.com)

Revise as follows:

1203.2 ~~Attic spaces.~~ Ventilation required. *(No change to body of text)*

1203.3 Unvented attic and unvented enclosed rafter assemblies. Unvented *attic* assemblies (spaces between the ceiling joists of the top *story* and the roof rafters) and unvented enclosed rafter assemblies (spaces between ceilings that are applied directly to the underside of roof framing members/rafters and the structural roof sheathing at the top of the roof framing members/rafters) shall be permitted where all the following conditions are met:

1. The unvented attic space is completely within the *building thermal envelope*.
2. No interior Class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed rafter assembly.
3. Where wood shingles or shakes are used, a minimum 1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In climate zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder, or shall have a Class III vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Either items 5.1 5.2 or 5.3 shall be met, depending on the air permeablity of the insulation directly under the structural roof sheathing.
   - 5.1. Air-impermeable insulation only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.
   - 5.2. Air-permeable insulation only. In addition to the *air-permeable insulation* installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified in Table 1203.3 for condensation control.
   - 5.3. Air-impermeable and air-permeable insulation. The *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table 1203.3 for condensation control. The air-permeable insulation shall be installed directly under the *air-impermeable insulation*.
   - 5.4. Where preformed insulation board is used as the *air-impermeable insulation* layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.
6. This section does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals, art galleries, or enclosures in climate zones 5 or higher that are humidified beyond 35 percent during the three coldest months.

TABLE 1203.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM RIGID BOARD ON AIR-IMPERMEABLE INSULATION R-VALUE[a,b]
2B and 3B tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	R-5
4C	R-10
4A, 4B	R-15
5	R-20
6	R-25
7	R-30
8	R-35

a. Contributes to, but does not supersede thermal resistance requirements for attic and roof assemblies in Section C402.2.1 of the *International Energy Conservation Code*.

b. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45 degrees F (7 degrees C). For calculation purposes, an interior air temperature of 68 degrees F (20 degrees C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.

Add new definition as follows:

AIR-IMPERMEABLE INSULATION. An insulation having an air permeance equal to or less than 0.02 l/s-m^2 at 75 pa pressure differential tested according to ASTM E 2178 or E 283.

Reason: Unvented roof assemblies - both attic and cathedral ceiling - are a proven technology. They give the designer significant flexibility in locating mechanical equipment and ductwork inside of conditioned spaces thereby saving energy. They significantly improve the airtightness of the building enclosure thereby saving energy. They reduce wind uplift forces and reduce the risk of wildfire damage. They eliminate the problems associated with wind driven rain entering roof vents during hurricanes. The language in this proposed section is modeled on the existing language in the IRC Section 806.5. The "air-impermeable insulation" definition is the same as in the IRC.

Cost Impact: This proposal will not raise the cost of construction.

G149-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.3 (NEW)-G-LSTIBUREK.doc

G150 – 12
1203.4, Chapter 35

Proponent: Stephanie Reiniche, ASHRAE (sreiniche@ashrae.org)

Revise as follows:

1203.4 Natural ventilation. Natural *ventilation* of an occupied space shall be ~~through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.~~ provided in accordance with Section 6.4 of ASHRAE Standard 62.1 or Section 4.1 of ASHRAE Standard 62.2, based on the occupancy of the space.

~~**1203.4.1 Ventilation area required.** The openable area of the openings to the outdoors shall be not less than 4 percent of the floor area being ventilated.~~

~~**1203.4.1.1 Adjoining spaces.** Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m2). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.~~

> ~~**Exception:** Exterior openings required for *ventilation* shall be permitted to open into a sunroom with *thermal isolation* or a patio cover provided that the openable area between the sunroom addition or patio cover and the interior room shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet (1.86 m^2). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.~~

~~**1203.4.1.2**~~ 1202.4.1 **Openings below grade.** *(no change)*

Add new standards to Chapter 35 as follows:

ASHRAE
American Society of Heating Refrigerating and Air-Conditioning Engineers
1791 Tullie Circle, Atlanta, GA 30319
(404) 636-8400

ASHRAE
62.1-2010 Ventilation for Acceptable Indoor Air Quality
62.2-2010 Ventilation for Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: The natural ventilation requirements currently in the IBC are based on ANSI/ASHRAE Standard 62-1989. Standard 62 has gone through many revisions since that time, and based on new information and research, the requirements today are quite different. The IMC requires mechanical ventilation that is consistent with the methodology in ASHRAE Standards 62.1-2007 and 62.2-2007. By referencing Standard 62.1 and 62.2, we will ensure that the natural ventilation requirements in the IBC are consistent with those required by both Standards 62.1 and 62.2, which are the ANSI standards for ventilation in buildings

As an alternative to this approach the provisions of the IBC can be updated to be consistent with ASHRAE 62.1 and 62.2 as follows:

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*.

Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*.

1203.4 Natural ventilation. ~~Natural *ventilation* of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.~~ Natural *ventilation* systems shall be designed and constructed in accordance with this section and shall include mechanical ventilation systems designed in accordance with the *International Mechanical Code*.

Exceptions:

1. An engineered natural *ventilation* system, when approved by the authority having jurisdiction
2. Mechanical *ventilation* systems are not required when:
   2.1. Natural ventilation openings are permanently open or have controls that prevent the openings from being closed during periods of expected occupancy, or
   2.2. The zone is not served by heating or cooling equipment.

1203.4.1 Ventilation area required. ~~The openable area of the openings to the outdoors shall be not less than 4 percent of the floor area being ventilated.~~ Spaces, or portions of spaces, to be naturally ventilated shall be located within a distance based on the ceiling height, as determined by Sections 1203.4.1.1, 1203.4.1.2, or 1203.4.1.3, from operable wall openings. For spaces with ceilings which are not parallel to the floor, the ceiling height shall be determined in accordance with Section 1203.4.1.4.

1203.4.1.1 Single Side Opening. For spaces with operable openings on one side of the space, the maximum distance from the operable openings shall be 2*H*, where *H* is the ceiling height.

1203.4.1.2 Double Side Opening. For spaces with operable openings on two opposite sides of the space, the maximum distance from the operable openings shall be 5*H*, where *H* is the ceiling height.

1203.4.1.3 Corner Openings. For spaces with operable openings on two adjacent sides of a space the maximum distance from the operable openings shall be 5*H* along a line drawn between the two openings which are farthest apart. The floor area outside that line is considered to be not naturally ventilated and shall comply with Section 1203.4.1.

1203.4.1.4 Ceiling Height. The ceiling height, *H*, to be used in Sections 1203.4.1 through 1203.4.3 shall be the minimum ceiling height in the space.

Exception: For ceilings that are increasing in height as distance from the openings is increased, the ceiling height shall be determined as the average height of the ceiling within 6 m (20 ft.) from the operable openings.

1203.4.2 Location and Size of Openings. Spaces, or portions of spaces, to be naturally ventilated shall be permanently open to operable wall openings directly to the outdoors, the openable area of which is a minimum of 4% of the net occupiable floor area. Where openings are covered with louvers or otherwise obstructed, openable area shall be based on the net free unobstructed area through the opening.

~~**1203.4.1.1**~~ **1203.4.2.1 Adjoining spaces.** Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m^2). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.

Exception: Exterior openings required for *ventilation* shall be permitted to open into a sunroom with *thermal isolation* or a patio cover provided that the openable area between the sunroom addition or patio cover and the interior room shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet (1.86 m^2). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.

~~**1203.4.1.2**~~ **1203.4.2.2 Openings below grade.** *(no change to text)*

1203.4.3 Control and Access. Building occupants shall have ready access to the means to open required operable openings. Controls shall be designed to properly coordinate operation of the natural and mechanical ventilation systems.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE 62.2-2010 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012. Note that ASHRAE 62.1 is currently referenced by the IMC.

G150-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.4 #1-G-FERGUSON.doc

G151 – 12
1203.4, 1203.4.1

Proponent: Steve Ferguson, ASHRAE (sferguson@ashrae.org)

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*.

Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*.

1203.4 Natural ventilation. ~~Natural *ventilation* of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.~~ Natural *ventilation* systems shall be designed and constructed in accordance with this section and shall include mechanical ventilation systems designed in accordance with the *International Mechanical Code*.

Exceptions:

1. An engineered natural *ventilation* system, when approved by the authority having jurisdiction
2. Mechanical *ventilation* systems are not required where:
   - 2.1. Natural ventilation openings are permanently open or have controls that prevent the openings from being closed during periods of expected occupancy, or
   - 2.2. The zone is not served by heating or cooling equipment.

1203.4.1 Ventilation area required. ~~The openable area of the openings to the outdoors shall be not less than 4 percent of the floor area being ventilated.~~ Spaces, or portions of spaces, to be naturally ventilated shall be located within a distance based on the ceiling height, as determined by Sections 1203.4.1.1, 1203.4.1.2, or 1203.4.1.3, from operable wall openings. For spaces with ceilings which are not parallel to the floor, the ceiling height shall be determined in accordance with Section 1203.4.1.4.

1203.4.1.1 Single Side Opening. For spaces with operable openings on one side of the space, the maximum distance from the operable openings shall be 2*H*, where *H* is the ceiling height.

1203.4.1.2 Double Side Opening. For spaces with operable openings on two opposite sides of the space, the maximum distance from the operable openings shall be 5*H*, where *H* is the ceiling height.

1203.4.1.3 Corner Openings. For spaces with operable openings on two adjacent sides of a space, the maximum distance from the operable openings shall be 5*H* along a line drawn between the two openings which are farthest apart. The floor area outside that line is considered to be not naturally ventilated and shall comply with Section 1203.4.1.

1203.4.1.4 Ceiling Height. The ceiling height, *H*, to be used in Sections 1203.4.1 through 1203.4.3 shall be the minimum ceiling height in the space.

> **Exception:** For ceilings that are increasing in height as distance from the openings is increased, the ceiling height shall be determined as the average height of the ceiling within 6 m (20 ft.) from the operable openings.

1203.4.2 Location and Size of Openings. Spaces, or portions of spaces, to be naturally ventilated shall be permanently open to operable wall openings directly to the outdoors, the openable area of which is a minimum of 4% of the net occupiable floor area. Where openings are covered with louvers or otherwise obstructed, openable area shall be based on the net free unobstructed area through the opening.

~~1203.4.1.1~~ **1203.4.2.1 Adjoining spaces.** Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m^2). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.

> **Exception:** Exterior openings required for *ventilation* shall be permitted to open into a sunroom with *thermal isolation* or a patio cover provided that the openable area between the sunroom addition or patio cover and the interior room shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet (1.86 m^2). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.

~~1203.4.1.2~~ **1203.4.2.2 Openings below grade.** *(no change to text)*

1203.4.3 Control and Access. Building occupants shall have ready access to the means to open required operable openings. Controls shall be designed to properly coordinate operation of the natural and mechanical ventilation systems.

Reason: The natural ventilation requirements currently in the IBC are based on ANSI/ASHRAE Standard 62-1989. Standard 62 has gone through many revisions since that time, and based on new information and research, the requirements today are quite different. The IMC requires mechanical ventilation that is consistent with the methodology in ASHRAE Standard 62.1. This proposal will make the requirements for natural ventilation consistent with ASHRAE Standard 62.1-2010

Cost Impact: This will not increase the cost of construction.

G151-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.4 #2-G-FERGUSON.doc

G152 – 12
1204.1

Proponent: David S. Collins, The Preview Group, Inc. (dcollins@preview-group.com)

Delete and substitute as follows:

~~**1204.1 Equipment and systems.** Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining an indoor temperature of not less than 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.~~

~~**Exception:** Space heating systems are not required for interior spaces where the primary purpose of the space is not associated with human comfort.~~

<u>**1204.1 Equipment and systems.** Fully enclosed interior spaces of Group A, B, E, I and R occupancies intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining a minimum indoor temperature of 68 degree F (20 degrees C) at a point 3 feet (914 mm) above the floor on the design heating day.</u>

Reason: Section 1204.1 provides arbitrary requirements for heat in all buildings and structures whether fully enclosed or fully open such as a pavilion. The existing exception is arbitrary as well in stating that where the primary purpose of the building is not for human comfort that heat is not required.

Nowhere in the code is human comfort defined. Research of the legacy codes reveals that this provision may have come from only one of the legacy codes that required heat for Group R occupancies only. It can be argued that the only occupancies that are intended for human comfort are Group R occupancies and that human comfort is secondary. If the code is really trying to regulate human comfort, then it can also be argued that air conditioning should be provided. People work in many different environments including inside and outside of structures. In all of these environments people must dress accordingly to provide warmth or minimal clothing so that the clothing does not capture body heat.

This code change eliminates the exception for human comfort and lists those occupancies where it can be reasonably assumed that providing heat should be a secondary purpose of the building. Group F, H, S and U occupancies are left to the discretion of the building owner as to the need for heat or for that matter cooling.

Cost Impact: The increased understanding of what the code intends regarding provisions for heating will significantly reduce the cost of design and review.

G152-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1204.1-G-COLLINS.doc

G153 – 12
1204.1

Proponent: Paul Armstrong, City of El Monte, representing Orange Empire Code Committee (paul@jaspacific.com)

Revise as follows:

1204.1 Equipment and systems. Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining an indoor temperature of not less than 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.

Exceptions:

1. Space heating systems are not required for interior spaces where the primary purpose of the space is not associated with human comfort.
2. Group F, H, S or U occupancies.

Reason: The addition of the exception will exempt Groups F, H, S or U occupancies from the heating requirement in the IBC. The current text is vague and as a result, unenforceable. There are many opinions as to what is or is not associated with human comfort. However, the requirement for heating in these uses is governed by OSHA regulations (Groups F, H and S) or is not needed (Group U) or, in some cases, not desired (Group H). As an example, industrial bakeries have been told that a heating system is needed in rooms that contain ovens. Warm air supply ducts were then installed to comply with this interpretation. The IBC should allow the exemption of heating in these uses.

Since it was felt that some other uses may take advantage of exception 1, it is not proposed for deletion.

Cost Impact: The code change proposal will not increase the cost of construction.

G153-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1204.1-G-ARMSTRONG.doc

G154 – 12
1205.3

Proponent: Jack Bailey, One Lux Studio, representing International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

1205.3 Artificial light. Artificial light shall be provided that is adequate to provide an average illumination of ~~10 footcandles (107 lux)~~ not less than 3 footcandles (32 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

Reason: To conserve energy. 10 footcandles is excessive for many space types, and providing excessive lighting wastes energy. The IES Handbook, 10th Edition, recommends that an average of 3 footcandles of illumination be provided in the following space types:

- Residential Circulation
- Restaurant Dining Areas, fine dining

The IES Handbook, 10th Edition, recommends that an average of 5 footcandles of illumination be provided in the following space types:

- Independent Passageways, public and back-of-house corridors (not adjacent to brighter spaces)
- Service stairways, corridors
- Elevators, Escalators
- Lounges
- Residential general lighting
- Restrooms
- Storage, inactive
- Food Storage (refrigerated and non-refrigerated)
- Locker Rooms

The IBC should not require that excessive lighting be provided in these types of spaces.

Cost Impact: The code change proposal will not increase the cost of construction.

G154-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1205.3-G-BAILEY.doc

G155 – 12
1205.3, Chapter 35

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

1205.3 Artificial light. Artificial light shall be provided that is adequate to provide an average illumination of 10 footcandles (107 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level. <u>Electrical luminaires permanently installed in non-hazardous locations shall be listed and labeled in accordance with UL 1598 and installed in accordance with the listing and the manufacturer's instructions.</u>

Add new standard to Chapter 35 as follows:

UL
<u>1598-2008 Luminaires, with revisions through January 11, 2010</u>

Reason: UL 1598 is an ANSI approved standard for luminaires. Although NFPA 70 Section 410.6 requires listing, it does not specify the applicable standard within the mandatory provisions of the code.

Cost Impact: The proposed changes will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, UL 1598-2008 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G155-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G156 – 12

1207, 1207.1, 1207.2 (NEW), 1207.2.1 (NEW), 1207.2.2 (NEW), Table 1207.2.2 (NEW)

Proponent: Amy Costello, Armstrong World Industries, Inc. (aacostello@armstrong.com)

Revise as follows:

SECTION 1207
SOUND TRANSMISSION AND QUALITY

1207.1 ~~**Scope.**~~ **Sound Transmission**. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units or between dwelling units and adjacent public area such as halls, corridors, stairs or service areas.

~~**1207.2**~~ **1207.1.1 Air-borne sound**. Walls, partitions and flooring /ceiling assemblies separating dwellings units from public or service areas shall have a sound transmission class (STC) of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Penetrations or opens in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to dwelling unit entrance doors; however, such doors shall be tight fitting to the frame and sill.

~~**1207.2.1**~~ **1207.1.1.1 Masonry**. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined through testing in accordance with ASTM 90.

~~**1207.3**~~ **1207.1.2 Structure-borne soun**d. Floor/ceiling assemblies between dwelling units and a public service area within the structure shall have an impact insulation class (IIC) rating of not less than 50 (45 if field tested) when tested in accordance with ASTM E 492.

1207.2 Sound quality. Sound quality shall be provided for Group E occupancy classrooms in accordance with Sections 1207.2.1 and 1207.2.2.

1207.2.1 Background noise. The noise from heating, ventilating and air conditioning (HVAC) systems occurring in classrooms within Group E occupancies shall be not exceed 45 dBA. Compliance shall be demonstrated by one of the following:

1. Calculations submitted with the construction documents; or
2. Field testing of the completed building prior to issuance of a certificate of occupancy. Field testing shall be conducted by an approved registered design professional and a report of the testing shall be provided to the building official.

1207.2.2 Interior sound reverberation. The reverberation time of the interior space within classrooms shall comply with Table 1207.2.2. Compliance shall be demonstrated by one of the following:

1. Calculations provided with the submitted construction documents; or
2. Field testing of the completed building prior to issuance of a certificate of occupancy. Field testing shall be conducted by an approved registered design professional and a report of the testing shall be provided to the building official.

TABLE 1207.2.2
REVERBERATION TIME REQUIREMENTS FOR OCCUPANCY CLASSIFICATION

Occupancy Classification	Room Types / Applications	T_{60} (sec)

Occupancy Classification	Room Types / Applications	T_{60} (sec)
Group E	Normal Classrooms (< 283 m^3 (10,000ft^3))	< 0.6
	Large Classrooms (between 283m^3 and 566 m^3 (20,000ft^3))	< 0.7

Reason: The mission of the IBC is to provide the highest quality codes, standards, products and services for all concerned with the safety and performance of the built environment. Schools are places of learning where speaking and listening are the primary communication modes. Until recently neither school planners nor were the general public aware of the significant negative effect of noise and excessive reverberation on the learning process. The large body of research describing this problem is making everyone more aware of the importance of good acoustics. Convincing evidence existing which shows that children do not fully understand speech in reverberant rooms. Classroom noise results in significant teaching/ learning problems, including teacher vocal fatigue and students' off-task behavior. In one survey (Smith et al., 1998), 32% of teachers reported having occasional voice fatigue, and 20% reported they had missed work due to voice problems. These consequences, along with the learning deficits experienced by students in noisy rooms, are the costs of the current situation. Teachers should have classrooms where they can use a natural teaching voice free from vocal stress. The additional of this performance requirement will provide a better learning environment for students and healthier environmental for teachers and the voices. This requirement is also consistent with the American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools (.ANSI S12.60-2010).

A prescriptive alternative approach to what has been proposed is as follows:

1207.2 Sound quality. Sound quality shall be provided for in Group E occupancy classrooms in accordance with one of the following:

1. All ceiling area material finishes excluding the area of lights, diffusers and grilles shall have a noise reduction coefficient (NRC) of not less than 0.70.
2. The total area of exposed sound-absorbing finishes on the floors, ceiling and/or walls shall equal or exceed the total ceiling area and shall have a noise reduction coefficient (NRC) of not less than 0.70.

Noise reduction coefficient shall be verified through data furnished by the manufacturer.

It was unclear whether this should be addressed within existing text or if there may be a preference for an entirely new section within Chapter 12 dedicated only to sound quality.

Cost Impact: Neither the background noise nor the reverberation time calculations are cost prohibitive.

G156-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1207-G-COSTELLO

G157 – 12
1207.1, 1207.2, 1207.3

Proponent: Jerry R. Tepe, FAIA, JRT•AIA Architect, representing The American Institute of Architects (jrtaia@aol.com)

Revise as follows:

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* and *sleeping units* or between *dwelling units* and *sleeping units* and adjacent public areas such as halls, *corridors*, *stairs* or service areas.

1207.2 Air-borne sound. Walls, partitions and floor/ceiling assemblies separating *dwelling units* and *sleeping units* from each other or from public or service areas shall have a sound transmission class (STC) of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to ~~*dwelling unit*~~ entrance doors; however, such doors shall be tight fitting to the frame and sill.

1207.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined through testing in accordance with ASTM E 90.

1207.3 Structure-borne sound. Floor/ceiling assemblies between *dwelling units* and *sleeping units* or between a *dwelling unit* or *sleeping unit* and a public or service area within the structure shall have an impact insulation class (IIC) rating of not less than 50 (45 if field tested) when tested in accordance with ASTM E 492.

Reason: The code currently regulates sound transmission between dwelling units (apartments) but not for sleeping units (hotel/motel rooms, dormitories). It seems obvious that sleeping units should be similarly protected. While many higher-end establishments already provide a degree of sound control, many of us have experienced the disturbing noise of a loud TV while trying to sleep in a hotel room.

This will increase the cost of construction by possibly requiring the addition of insulation in the separating construction. However, other provisions of the code require this construction to have a fire-resistance rating, many of which assemblies already have insulation included.

Cost Impact: This code change proposal will increase cost of construction.

G157-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1207.1-G-TEPE

G158 – 12
1208.2

Proponent: Dennis Richardson, P.E., CBO, City of Salinas, Tri-Chapter (Peninsula, East Bay and Monterey Chapters, ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1208.2 Minimum ceiling heights. Occupiable spaces, *habitable spaces* and *corridors* shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. In one- and two-family *dwellings*, beams or girders spaced not less than 4 feet (1219 mm) on center shall be permitted to project not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof.
3. The height of *mezzanines* and spaces below m*ezzanines* shall be in accordance with Section 505.1.
4. <u>Corridors contained within a dwelling or sleeping unit in a Group R occupancy shall have a ceiling height of not less than 7 feet (2134 mm).</u>

Reason: To provide consistency with IRC Section R305.1. It appears the allowance for 7' ceiling height inside dwelling units was omitted from the IBC.

Cost Impact: The code change will not increase the cost of construction.

G158-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1208.2 #1-G-RICHARDSON.doc

G159 – 12
1208.2

Proponent: Joseph DeSante, City of Salinas, representing Tri-Chapter (Peninsula, East Bay, and Monterey Chapters ICC) (joesphd@ci.salinas.ca.us)

Revise as follows:

1208.2 Minimum ceiling heights. Occupiable spaces, *habitable spaces* and *corridors* shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. In one- and two-family *dwellings*, beams or girders spaced not less than 4 feet (1219 mm) on center shall be permitted to project not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof.
3. The height of *mezzanines* and spaces below m*ezzanines* shall be in accordance with Section 505.1.
4. Within R-2 and R-3 occupancies, habitable space, hallways, bathrooms, toilet rooms, laundry rooms and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm).

Reason: To provide consistency with IRC Section R305.1. It appears the allowance for 7' ceiling height inside dwelling units was omitted from the IBC.

Cost Impact: The code change will not increase the cost of construction.

G159-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1208.2-G-DESANTE.doc

G160 – 12
1210.2.3

Proponent: Homer Maiel, PE, CBO, Town of Atherton (CA), representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1210.2.3 Showers. Shower compartments and walls above bathtubs with installed shower heads shall be finished with a smooth, nonabsorbent surface to a height not less than ~~70~~ 72 inches (~~1778~~ 1829 mm) above the drain inlet.

Reason: There is currently inconsistency between IBC and IRC. This will bring IBC in line with IRC.

Cost Impact: This code change may increase the cost of construction.

G160-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1210.2.3-G-MAIEL

G161 – 12
1210.4

Proponent: Tim Pate, City and County of Broomfield, Colorado, representing Colorado Chapter Code Change Committee

Revise as follows:

~~**1210.4**~~ **2902.3.6** **Toilet room location.** Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

Reason: It has never made sense why there was a section dealing with location of a toilet room in relation to rooms used for preparation of food located in Chapter 12 – which is titled Interior Environment.

The requirements for finish materials for both walls and floors of bathrooms and for privacy have been relocated to Chapter 12 which makes sense but requirements for locations should not be in this chapter. This requirement should still be located within Chapter 29 which deals with Plumbing systems and specifically bathrooms. This chapter has numerous requirements for routes and locations already.

Cost Impact: This proposal will not increase the cost of construction.

G161-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1210.4-G-PATE.doc

G162 – 12

PART I – IBC GENERAL
1211.1 (NEW), TABLE 1211.1(1) (NEW), TABLE 1211.1(2) (NEW), CHAPTER 35
PART II– IBC GENERAL
12.11.2 (NEW), TABLE 1211.2(1) (NEW), TABLE 1211.2(2) (NEW), CHAPTER 35
PART III– IBC GENERAL
1211.3 (NEW), TABLE 1211.3(1) (NEW), TABLE 1211.3(2) (NEW), CHAPTER 35
PART IV– IBC GENERAL
1211.4 (NEW), TABLE 1211.4(1) (NEW), TABLE 1211.4(2) (NEW), CHAPTER 35
PART V – IBC GENERAL
1211.5 (NEW), TABLE 1211.5 (NEW), CHAPTER 35
PART VI– IBC GENERAL
1201.1
PART VII– IBC GENERAL
202

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

THIS IS A 7 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC GENERAL COMMITTEE.

PART I- IBC GENERAL

Add new text as follows:

SECTION 1211
MATERIAL EMISSIONS

1211.1 Adhesives and sealants. A minimum of 85 percent by weight or volume, of site-applied adhesives and sealants shall comply with the VOC content limits in Table 1211.1(1) or VOC emissions limits in Table 1211.1 (2). The VOC content shall be determined in accordance with the appropriate standard being either U.S. EPA Method 24, SCAQMD Method 304, 316A or 316B. The exempt compound content shall be determined by either SCAQMD Methods 302 and 303 or ASTM D 3960. Table 1211.1 (1) adhesives and sealants regulatory category and VOC content compliance determination shall conform to the SCQMD Rule 1168. The provisions of this section shall not apply to adhesives and sealants subject to state or federal consumer product VOC regulations. HVAC duct sealants shall be classified as “Other” category within the SCAQMD Rule 1168 sealants table.

> **Exception**: HVAC air duct sealants are not required to meet the emissions or the VOC content requirements when the air temperature in which they are applied is less than 40°F (4.5°C). Single-ply roof membrane adhesives shall be exempt from the requirements of Table 806.2(1) in climate zones 6, 7 and 8 as identified in the International Energy Conservation Code.

Table 1211.2(2) adhesive alternative emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V1.1 test methodology in the scope of its ISO 17025 Accreditation.

TABLE 1211.1 (1)
SITE APPLIED ADHESIVE AND SEALANTS VOC LIMITS[a.b]

ADHESIVE	VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural Sealants	250
Architectural Sealant Primer Non Porous Porous	 250 775
Modified Bituminous Sealant Primer	500
Other Sealant Primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140

a. *VOC* limit less water and less exempt compounds in grams/liter
b. For low-solid adhesives and sealants, the *VOC* limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the *VOC* limits are expressed as grams of *VOC* per liter of adhesive or sealant less water and less exempt compounds as specified in SCAQMD Rule 1168.

TABLE 1211.2 (2)
VOC EMISSION LIMITS

VOC	LIMIT
Individual VOCs	≤ ½ CA chronic REL[a]
Formaldehyde	≤ 9 $\mu g/m^3$ or ≤ 7 ppb

a. CDPH/EHLB/Standard Method V1.1 Chronic Reference Exposure Level (CREL)

Add new standards to Chapter 35 as follows:

U. S. Environmental Protection Agency
Stationary Source Compliance Division
Washington, D.C.

US EPA Method 24 (issued 8/6/1993) Determination of Volatile Matter Content, Water Content, Density, Volume Solids and Weight Solids of Surface Coatings

South Coast Air Quality Management District
21865 Copley Dr
Diamond Bar, CA 91765

METHOD 302-91 Distillation of Solvents From Paints, Coatings and Inks, Revised February 1993
METHOD 303-91 Determination of Exempt Compounds, Revised February 1993
METHOD 304-91 Determination of Volatile Organic Compounds (Voc) in Various Materials, Revised February, 1996
METHOD 316A-92 Determination of Volatile Organic Compounds (Voc) in Materials Used For Pipes and Fittings, Revised October, 1996
METHOD 316B-97 Determination of Volatile Organic Compounds (Voc) in Adhesives Containing Cyanoacrylates
Rule 1168-1989 Adhesive and Sealant Applications, with amendments through January 7, 2005

ASTM
ASTM D3960—05 Standard Practice of Determining Volatile Organic Compound (VOC) Content of Paints & Related Coatings

California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804

CDPH/EHLB/Standard Method V1.1 "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.1" dated February 2010, California Department of Public Health

ISO
ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories

PART II – IBC GENERAL

Add new text as follows:

1211.2 Architectural paints and coatings. A minimum of 85 percent by weight or volume, of site-applied interior architectural coatings shall comply with VOC content limits in Table 1211.2(1) or the alternate emissions limits in Table 1211.2 (2). The exempt compound content shall be determined by ASTM D3960.

Table 1211.2 (2) architectural coating alternate emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/STANDARD METHOD V.1.1 The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/STANDARD METHOD V 1.1 test methodology in the scope of its ISO 17025 Accreditation.

TABLE 1211.2 (1)
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[c,d]

Coating Category	**LIMIT[a] g/l**
Flat Coatings	50
Non-flat Coatings	100
Non-flat - High Gloss Coatings	150
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350

Coating Category	LIMIT[a] g/l
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120[b]
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

a. Limits are expressed as *VOC* Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
b. Limit is expressed as *VOC* actual.
c. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
d. Table 1211.2(1) architectural coating regulatory category and *VOC* content compliance determination shall conform to the California Air Resources Board *Suggested Control Measure for Architectural Coatings*.

Table 1211.2 (2)
ARCHITECTURAL COATINGS VOC EMISSION LIMITS

VOC	LIMIT
Individual	≤½ CA chronic REL[a]
Formaldehyde	≤ 9 μg/m^3 or ≤ 7 ppb

a. CA Chronic Reference Exposure Level (CREL)

Add new standards to Chapter 35 as follows:

California Environmental Protection Agency
Air Resources Board
1001 I Street
Sacramento, CA 95814

California Air Resources Board *Suggested Control Measure for Architectural Coatings,* February 1, 2008
ASTM D3960—05 Standard Practice of Determining Volatile Organic Compound (VOC) Content of Paints & Related Coatings

California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804

CDPH/EHLB/Standard Method V1.1-2010 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.1

ISO
ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories

PART III – IBC GENERAL

Add new text as follows:

1211.3 Flooring. A minimum of 85 percent of the total area of flooring installed within the interior of the building shall comply with the requirements of Table 1211.3 (2). Where flooring with more than one distinct product layer is installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/STANDARD METHOD V.1.1 The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/STANDARD METHOD V 1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post manufacture coatings or surface applications have not been applied, the flooring listed in Table 1211.3 (1) shall be deemed to comply with the requirements of Table 1211.3 (2).

TABLE 1211.3 (1)
FLOORING DEEMED TO COMPLY WITH VOC EMISSION LIMITS

Ceramic and concrete tile
Organic-free, mineral-based
Clay pavers
Concrete pavers
Concrete
Metal

TABLE 1211.3 (2)
FLOORING VOC EMISSION LIMITS

VOC	LIMIT
Individual VOCs	≤½ CA chronic REL[a]
Formaldehyde	≤ 9 μg/m^3 or ≤ 7 ppb

a. CA Chronic Reference Exposure Level (CREL)

Add new standards to Chapter 35 as follows:

California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804

CDPH/EHLB/Standard Method V1.1-2010 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.1

ISO
ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories

PART IV – IBC GENERAL

Add new text as follows:

1211.4 Acoustical ceiling tiles and wall systems. A minimum of 85 percent of acoustical ceiling tiles and wall systems, by square feet, shall comply with the requirements of Table 1211.4 (2). Where ceiling and wall systems with more than one distinct product layer are installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/STANDARD METHOD V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/STANDARD METHOD V 1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post manufacture coatings or surface applications have not been applied, the ceiling or wall systems listed in Table 1211.4 (1) shall be deemed to comply with the requirements of Table 1211.4 (2).

TABLE 1211.4 (1)
CEILING AND WALL SYSTEMS DEEMED TO COMPLY
WITH VOC EMISSION LIMITS

Ceramic tile
Organic-free, mineral-based
Clay masonry
Concrete masonry
Concrete
Gypsum Plaster
Metal

TABLE 1211.4 (2)
ACOUSTICAL CEILING TILES AND WALL SYSTEMS
VOC EMISSION LIMITS

VOC	**LIMIT**
Individual	≤½ CA chronic REL[a]
Formaldehyde	≤ 9 µg/m^3 or ≤ 7 ppb

a. CA Chronic Reference Exposure Level (CREL)

Add new standards to Chapter 35 as follows:

California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804

CDPH/EHLB/Standard Method V1.1-2010 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.1

ISO
ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories

PART V – IBC GENERAL

1211.5 Insulation. A minimum of 85 percent of insulation shall comply with the requirements of Table 1211.5. The test methodology used to determine compliance shall be from CDPH/EHLB/STANDARD METHOD V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/STANDARD METHOD V 1.1test methodology in the scope of its ISO 17025 Accreditation.

TABLE 1211.5
INSULATION
VOC EMISSION LIMITS

VOC	LIMIT
Individual VOCs	≤½ CA chronic REL[a]
Formaldehyde	≤ 9 µg/m^3 or ≤ 7 ppb

a. CA Chronic Reference Exposure Level (CREL)

Add new standards to Chapter 35 as follows:

California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804

CDPH/EHLB/Standard Method V1.1-2010 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version1.1

ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories

PART VI– IBC GENERAL

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern ventilation, temperature control, lighting, *yards* and *courts*, sound transmission, room dimensions, surrounding materials, material emissions and rodent proofing associated with the interior spaces of buildings.

PART VII - IBC GENERAL

Add new definition to Chapter 2 as follows:

VOLATILE ORGANIC COMPOUND (VOC). A chemical compound based on carbon chains or rings that typically contain hydrogen and sometimes contain oxygen, nitrogen and other elements, and that has a boiling point in the range from (50 °C to 100 °C) to (240 °C to 260 °C).

Reason: (Part I) This proposal is part of a series of proposals to add material emissions to Chapter 12 of the IBC. With all buildings looking to save energy, and therefore money, by sealing up the indoor environment, protection from what we put in the building ourselves has never been more necessary. Including material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants. The threshold of 85% was chosen as to recognize that there may be some products that are not recognized as complying with these criteria get used on a construction site, but they are minimized to help provide a reasonable level of protection for individuals without being overly onerous.

These requirements are already in use in numerous municipalities, state, and government codes and programs and there are thousands of products from many manufacturers around the world that have proven to satisfy the proposed criteria in this section, at competitive prices, which ensures there is enough supply to satisfy the demand. With these thousands of products available the cost of development and purchase has steadily come down to levels that are on par with other products. Code officials, designers, installers, and building owners have many free resources to find compliant products and manufacturers even have ways to prove compliance to these requirements on their own.

The documents added to Chapter 35 are previously referenced in the International Green Construction Code and they have been proven to be appropriate and acceptable for making the evaluations of VOC content and emissions that are detailed in the proposal.

Bibliography:

CDPH/EHLB/Standard Method V1.1 **http://www.cal-iaq.org/download-voc-publications/voc-publications/standard-method-for-the-testing-and-evaluation-of-volatile-organic-chemical-emissions-from-indoor-sources-using-environmental-chambers-version-1-1-2010**

U.S. EPA Method 24: **http://www.epa.gov/ttn/emc/promgate/m-24.pdf**

SCAQMD
Method 302: http://www.aqmd.gov/tao/methods/lab/302-91.pdf
Method 303: www.aqmd.gov/tao/methods/lab/303-91.pdf
Method 304 http://www.aqmd.gov/tao/methods/lab/304-91.pdf
Method 316A www.aqmd.gov/tao/methods/lab/316A-92.pdf
Method 316B: www.**aqmd**.gov/tao/**methods**/lab/**316B**-92.pdf
Rule 1168: http://www.aqmd.gov/rules/reg/reg11/r1168.pdf

Reason: (Part II) This proposal is part of a series of proposals to add material emissions to Chapter 12 of the IBC. With all buildings looking to save energy, and therefore money, by sealing up the indoor environment, protection from what we put in the building ourselves has never been more necessary. Including material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants.

The threshold of 85% was chosen as to recognize that there may be some products that are not recognized as complying with these criteria get used on a construction site, but they are minimized to help provide a reasonable level of protection for individuals without being overly onerous.

These requirements are already in use in numerous municipalities, state, and government codes and programs and there are thousands of products from many manufacturers around the world that have proven to satisfy the proposed criteria in this section, at competitive prices, which ensures there is enough supply to satisfy the demand. With these thousands of products available the cost of development and purchase has steadily come down to levels that are on par with other products. Code official's designers, installers, and building owners have many free resources to find compliant products and manufacturers even have ways to prove compliance to these requirements on their own. More and more of these products are coming in to our marketplace every day as many states and municipalities are already adopting these types of measures as what must be purchased in their jurisdictions.

The documents added to Chapter 35 are previously referenced in the International Green Construction Code and they have been proven to be appropriate and acceptable for making the evaluations of VOC content and emissions that are detailed in the proposal.

Bibliography:

CDPH/EHLB/Standard Method V1.1 **http://www.cal-iaq.org/download-voc-publications/voc-publications/standard-method-for-the-testing-and-evaluation-of-volatile-organic-chemical-emissions-from-indoor-sources-using-environmental-chambers-version-1-1-2010**

California Air Resources Board *Suggested Control Measure for Architectural Coatings,* February 1, 2008
http://www.arb.ca.gov/coatings/arch/Approved_2007_SCM.pdf

Reason: (Part III) This proposal is part of a series of proposals to add material emissions to Chapter 12 of the IBC. With all buildings looking to save energy, and therefore money, by sealing up the indoor environment, protection from what we put in the building ourselves has never been more necessary. Including material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants.

These requirements are already in use in numerous municipalities, state, and government codes and programs and there are thousands of products from many manufacturers around the world that have proven to satisfy the proposed criteria in this section, at competitive prices, which ensures there is enough supply to satisfy the demand. With these thousands of products available the cost of development and purchase has steadily come down to levels that are on par with other products. Code officials, designers, installers, and building owners have many free resources to find compliant products and manufacturers even have ways to prove compliance to these requirements on their own. Many newly compliant products in all types of flooring are finding their way in to the marketplace every day as even multiple flooring manufacturer associations have their own programs which already show compliance to these criteria.

The documents added to Chapter 35 are previously referenced in the International Green Construction Code and they have been proven to be appropriate and acceptable for making the evaluations of VOC content and emissions that are detailed in the proposal.

Bibliography:

CDPH/EHLB/Standard Method V1.1 **http://www.cal-iaq.org/download-voc-publications/voc-publications/standard-method-for-the-testing-and-evaluation-of-volatile-organic-chemical-emissions-from-indoor-sources-using-environmental-chambers-version-1-1-2010**

Reason: (Part IV) This proposal is part of a series of proposals to add material emissions to Chapter 12 of the IBC. With all buildings looking to save energy, and therefore money, by sealing up the indoor environment, protection from what we put in the building ourselves has never been more necessary. Including material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants.

These requirements are already in use in numerous municipalities, state, and government codes and programs and there are thousands of products from many manufacturers around the world that have proven to satisfy the proposed criteria in this section, at competitive prices, which ensures there is enough supply to satisfy the demand. With these thousands of products available the cost of development and purchase has steadily come down to levels that are on par with other products. Code officials, designers, installers, and building owners have many free resources to find compliant products and manufacturers even have ways to prove compliance to these requirements on their own. More and more of these products are coming in to our marketplace every day as many states and municipalities are already adopting these types of measures as what must be purchased in their jurisdictions.

The documents added to Chapter 35 are previously referenced in the International Green Construction Code and they have been proven to be appropriate and acceptable for making the evaluations of VOC content and emissions that are detailed in the proposal.

Bibliography:

CDPH/EHLB/Standard Method V1.1 **http://www.cal-iaq.org/download-voc-publications/voc-publications/standard-method-for-the-testing-and-evaluation-of-volatile-organic-chemical-emissions-from-indoor-sources-using-environmental-chambers-version-1-1-2010**

Reason: (Part V) This proposal is part of a series of proposals to add material emissions to Chapter 12 of the IBC. With all buildings looking to save energy, and therefore money, by sealing up the indoor environment, protection from what we put in the building ourselves has never been more necessary. Including material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants.

These requirements are already in use in numerous municipalities, state, and government codes and programs and there are thousands of products from many manufacturers around the world that have proven to satisfy the proposed criteria in this section, at competitive prices, which ensures there is enough supply to satisfy the demand. With these thousands of products available the cost of development and purchase has steadily come down to levels that are on par with other products. Code officials, designers, installers, and building owners have many free resources to find compliant products and manufacturers even have ways to prove compliance to these requirements on their own. More and more of these products are coming in to our marketplace every day as many states and municipalities are already adopting these types of measures as what must be purchased in their jurisdictions.

The documents added to Chapter 35 are previously referenced in the International Green Construction Code and they have been proven to be appropriate and acceptable for making the evaluations of VOC content and emissions that are detailed in the proposal.

Bibliography:

CDPH/EHLB/Standard Method V1.1 **http://www.cal-iaq.org/download-voc-publications/voc-publications/standard-method-for-the-testing-and-evaluation-of-volatile-organic-chemical-emissions-from-indoor-sources-using-environmental-chambers-version-1-1-2010**

Reason: (Part VI) This proposal is part of a series of proposals to add material emissions to Chapter 12 of the IBC. Including requirements to limit occupant exposure from harmful chemicals is necessary in order to meet the IBC's scope to safeguard public health. Studies from around the globe (see below for links to some of these) continue to show that exposure to high levels of harmful chemicals in our indoor environment can cause not only severe discomfort, but headaches, nose bleeds, increased asthma attacks, the onset of asthma, and potential long-term health effects. High levels of chemical exposure have even led to an increase in C-reactive protein levels in human subjects, which is the body's response to inflammation. The human body does not always react well to some of the chemicals that are being released by man-made products.

Including these minimum material emission restrictions in the IBC will ensure that all building occupants, not just those fortunate enough to be in a 'sustainable' building will be protected from harmful chemicals and pollutants.

Bibliography:

Studies:
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www.iaqscience.lbl.gov/pdfs/voc-1.pdf
http://oem.bmj.com/content/52/6/388.abstract?ijkey=a259a5df5523262ebc77dbf9c265a51aa6d71686&keytype2=tf_ipsecsha
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http://www.bioportfolio.com/resources/pmarticle/76147/Volatile-Organic-Compounds-Exposure-And-Cardiovascular-Effects-In-Hair-Salons.html
http://onlinelibrary.wiley.com/doi/10.1111/j.1600-0668.2010.00673.x/abstract

Reason: (Part VII) Need to provide the definition for a new term used in a proposed new Section 1211.

Cost Impact: The proposed changes will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, as listed below, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

- US EPA Method 24 (issued 8/6/1993)
- South Coast Air Quality Management District
  - METHOD 302-91
  - METHOD 303-91
  - METHOD 304-91
  - METHOD 316A-92
  - METHOD 316B-97
  - Rule 1168-1989
- ASTM D3960—05
- CDPH/EHLB/Standard Method V1.1
- ISO/IEC 17025-2005

G162-12
PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART V – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VI – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VII – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1211 (NEW)-G-EUGENE.doc

G163 – 12
3001.2, Chapter 35

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3001.2 Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to ASME A17.1/CSA B44, ASME A17.7/CSA B44.7, ASME A90.1, ASME B20.1, ALI ALCTV, and ASCE 24 for construction in flood hazard areas established in Section 1612.3.

Add new standard to Chapter 35 as follows:

ASME

ASME A17.7-2007/CSA B44-07 Performance-Based Safety Code for Elevators and Escalators

Editorially change references to "ASME A17.1/CSA B44 or ASME A17.7/CSA B44.7" elsewhere in the code:

Sections	
907.3.3	911.1.5(17)
1007.4	1607.9.1
3001.4	3002.5
3003.2	3007.1
3007.2	3008.2.1
3008.7.6	3008.8.1
3411.8.2	

Reason: The *ASME A17.7/CSA B44-07 Performance-Based Safety Code for Elevators and Escalators* is already recognized and permitted by the 2009 *International Building Co*de by virtue of the latter's reference to ASME A17.1/CSA B44, which states:

1.2.1 Purpose

The purpose of this Code is to provide for the safety of life and limb, and to promote the public welfare. Compliance with this Code shall be achieved by

(a) conformance with the requirements in ASME A17.1/CSA B44; or

(b) conformance with some of the requirements in ASME A17.1/CSA B44 and for systems, subsystems, components, or functions that do not conform with certain requirements in ASME A17.1/CSA B44, conform with the applicable requirements in ASME A17.7/CSA B44.7; or

(c) conformance with the requirements in ASME A17.7/CSA B44.7.

This code change will merely make explicit the legal adoption of the ASME Performance-Based Code in those jurisdictions that have adopted the 2009 IBC or 2015 IBC without amendment to Section 3001.2.

Unlike other performance codes that provide little direction on how they should be enforced, the *ASME A17.7/CSA B44-07 Performance-Based Safety Code for Elevators and Escalators* provides a structured methodology for establishing, documenting, and demonstrating that necessary and appropriate protective measures are taken to eliminate hazards or sufficiently mitigate risks (see attached flow chart). This process is particularly useful for establishing safety of elevator systems, sub-systems, components, or functions involving innovative design and new technologies. Based on meeting Global Essential Safety Requirements (GESRs), this methodology is most often performed by independent Accredited Elevator/Escalator Certifying Organization (AECO), and the AECO certifies to the code enforcing authorities that the elevator meets the requirements in the PBC (see attached flow chart).

The *Performance-Based Safety Code for Elevators and Escalators* has already been adopted by numerous US jurisdictions through separate elevator codes, laws and regulations. These include:

Chicago
Colorado
Florida
Illinois
Iowa

Kentucky
Nevada
New Hampshire
North Carolina
South Carolina
Utah

Additionally, most US jurisdictions have already permitted the installation of elevator products that conform with *ASME A17.7/CSA B44-07* but not the 2009 or earlier edition of ASME A17.1 referenced in their IBC-based building codes. Examples of this type of technology include elevators installed in wind turbine towers and elevators utilizing coated steel belt suspension means instead of traditional elevator ropes (cables).

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A17.7-2007/CSA B44-07with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G163-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3001.2-G-BLACK

G164 – 12
3001.2, Chapter 35

Proponent: Victor D. Azzi, PhD, PE, Consulting Engineer, representing the Lift Manufacturers Product Section (LMPS), a division of the Material Handling Industry of America (MHIA) (victorazzi@comcast.net)

Revise as follows:

3001.2 Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, *alteration*, repair and maintenance of elevators and conveying systems and their components shall conform to ASME A17.1/ CSA B44, ASME A90.1, ASME B20.1, <u>ANSI MH29.1,</u> ALI ALCTV, and ASCE 24 for construction in *flood hazard areas* established in Section 1612.3.

Add new standard to Chapter 35 as follows:

ANSI
<u>MH29.1-2008 The Safety Requirements for Industrial Scissor Lifts</u>

Reason: The proposed addition to Section 3001.2 is intended to add industrial scissors lifts, a common and industry-wide accepted vertical conveyance used in buildings since the early 1950's. This addition will help avoid the possibility of confusion by using the appropriate standard to define these types of vertical lifting devises.

As one example of the confusion that existed when, in Minneapolis, the Minnesota State Building Code was following the 2006 IBC. A City of Minneapolis building inspector in March 2008 was inspecting a new installation of an industrial scissors lift used as a loading dock. The only referenced standard in IBC Chapter 30 (Elevators and Conveying Systems) that seemed to be applicable was ASME B20.1, so he applied that standard. The other referenced standards in IBC 3001.2 were elevators (A17.1), belt manlifts (A90.1), and automotive lifts (ALI ALCTV). The inspector rationalized that, because the Minnesota State Building Code does not specifically recognize industrial scissor lifts, they are prohibited unless the manufacturer could show that they meet the intended safety requirements of the code he chose for the conveyance. The IBC is the minimum requirement for safety in that state. In order to gain approval, the manufacturer's scissors lift was required, in that case, to meet or exceed the level of safety that was intended for a completely different devise – a conveyor as defined and regulated by ASME B20.1.

ANSI MH29.1 is a stand-alone, nationally accepted ANSI standard, and has been for some eighteen years. It is the only standard that applies to industrial scissor lifts in exactly the same way that ASME B20.1 applies to conveyors, A17.1 applies to elevators, A90.1 applies to belt manlifts, or ALI ALCTV applies to automotive service lifts.

Abstract of ANSI MH29.1
Mobile and stationary industrial scissors lifts raise, lower and position materials and personnel in various applications but are different from other conveyances such as aerial work platforms (AWP) and elevators. In an effort to be referenced in the International Building Code (IBC) along with conveying systems and elevators, MH29.1 has been revised to better illustrate that personnel operate and may themselves be raised or lowered by industrial scissor lifts. This standard now defines dock lifts, work access lifts and lift tables as the three categories of industrial scissors lifts and identifies their differences and similarities. The responsibilities of manufacturers, users, owners and operators have been reordered, consolidated and enhanced. Lastly, the requirements within the standard have been revised, where needed, to ensure they are stated using mandatory language. This revision of MH29.1 is stronger and less ambiguous than previous versions of this standard.

This revision also contains a new section on operator responsibilities and modifies values related to the indicator bars in the section on platform protection.

See attached images of typical installations of scissor lifts in buildings.

- Scissors lift in 3-sided pit at loading dock # 1
- Scissors lift in 3-sided pit at loading dock # 2
- Scissors lift in front of loading dock
- Two scissors lifts at a loading dock

<u>Referenced Standards</u>

ANSI MH29.1 – The Safety Requirements for Industrial Scissor Lifts
ASME B20.1 – The safety Standard for Conveyors and Related Equipment

Cost Impact: This addition to the code will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI MH29.1-2008 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G164-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3001.2-G-AZZI.doc

G165 – 12
3002.4

Proponent: Steve Willis, County of Lancaster, South Carolina, representing Lancaster County Emergency Medical Services (swillis@lancastercountysc.net)

Revise as follows:

3002.4 Elevator car to accommodate ambulance stretcher. Where elevators are provided in buildings ~~four~~ two or more stories above grade plane or four two or more stories below grade plane, at least one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate a 24-inch by 84-inch (610 mm by 1930 mm) ambulance stretcher in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than 3 inches (76 mm) high and shall be placed inside on both sides of the hoistway door frame.

Reason: Motorized/ mechanized gurneys are the norm these days. Along with medical gear, oxygen cylinders, etc. the use of stairs greatly extends the time it takes to reach/ remove a patient and can easily lead to injury of the paramedic. A suitable elevator allows the gurney and patient to be transported safely and quickly.

If additional information is needed from EMS for committee consideration, we will be happy to provide such.

Cost Impact: I would presume there would be some slight cost increase in construction for buildings of three stories or less; however, if planning on the proper size elevator from the beginning, this might not be the case.

G165-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3002.4-G-WILLIS

G166 – 12
3004

Proponent: Jonathan Siu, City of Seattle Department of Planning & Development, Richard Bukowski, The RJA Group, Inc., Dave Frable, U.S. General Services Administration

Revise as follows:

~~**SECTION 3004**~~
~~**HOISTWAY VENTING**~~

~~**3004.1 Vents required.** Hoistways of elevators and dumbwaiters penetrating more than three stories shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.~~

> ~~**Exception:** Venting is not required for the following elevators and hoistways:~~
>
> 1. ~~In occupancies of other than Groups R-1, R-2, I-1, I- 2 and similar occupancies with overnight *sleeping units*, where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~
> 2. ~~Sidewalk elevator hoistways.~~
> 3. ~~Elevators contained within and serving *open parking garages* only.~~
> 4. ~~Elevators within individual residential *dwelling units*.~~

~~**3004.2 Location of vents.** Vents shall be located at the top of the hoistway and shall open either directly to the outer air or through noncombustible ducts to the outer air. Noncombustible ducts shall be permitted to pass through the elevator machine room, provided that portions of the ducts located outside the hoistway or machine room are enclosed by construction having not less than the *fire-resistance rating* required for the hoistway. Holes in the machine room floors for the passage of ropes, cables or other moving elevator equipment shall be limited as not to provide greater than 2 inches (51 mm) of clearance on all sides.~~

~~**3004.3 Area of vents.** Except as provided for in Section 3004.3.1, the area of the vents shall be not less than 31/2 percent of the area of the hoistway nor less than 3 square feet (0.28 m2) for each elevator car, and not less than 31/2 percent nor less than 0.5 square feet (0.047 m2) for each dumbwaiter car in the hoistway, whichever is greater. Of the total required vent area, not less than one-third shall be permanently open. Closed portions of the required vent area shall consist of openings glazed with annealed glass not greater than 1/8 inch (3.2 mm) in thickness.~~

> ~~**Exception:** The total required vent area shall not be required to be permanently open where all the vent openings automatically open upon detection of smoke in the elevator lobbies or hoistway, upon power failure and upon activation of a manual override control. The manual override control shall be capable of opening and closing the vents and shall be located in an *approved* location.~~

~~**3004.3.1 Reduced vent area.** Where mechanical *ventilation* conforming to the *International Mechanical Code* is provided, a reduction in the required vent area is allowed provided that all of the following conditions are met:~~

1. ~~The occupancy is not in Group R-1, R-2, I-1 or I-2 or of a similar occupancy with overnight *sleeping units*.~~
2. ~~The vents required by Section 3004.2 do not have outside exposure.~~
3. ~~The hoistway does not extend to the top of the building.~~
4. ~~The hoistway and machine room exhaust fan is automatically reactivated by thermostatic means.~~
5. ~~Equivalent venting of the hoistway is accomplished.~~

~~3004.4~~ 3002.9 **Plumbing and mechanical systems.** Plumbing and mechanical systems shall not be located in an elevator hoistway enclosure.

Exception: Floor drains, sumps and sump pumps shall be permitted at the base of the hoistway enclosure provided they are indirectly connected to the plumbing system.

Reason: The purpose of this code change proposal is to delete the requirement for providing vents in elevator hoistways, since the provisions are potentially harmful, conflict with other provisions in the code, and are now considered unnecessary in the elevator safety standard adopted by reference in the IBC.

The purpose of hoistway venting is unclear in terms of the original intent. Provisions date back to the 1950s but appear to be focused more upon firefighting and post-fire overhaul. Since that time, the provisions have shifted for the vents to be readily available (always open) or to operate automatically via a smoke detector in the lobby or the hoistway. The concern is that such venting may have the effect of drawing smoke through the building where it is not appropriate. This is a specific concern after consideration of overall smoke movement by the CTC Elevator Lobby Study Group related to stack effect and preventing smoke movement throughout the building. This provision also conflicts with the allowance for hoistway pressurization in accordance with Section 909.21 which does not currently exempt hoistway venting when using pressurization. Furthermore, the requirement for hoistway venting has been removed from the 2010 edition of the ANSI/ASME A17.1 Safety Code for Elevators and Escalators, no conflict will result from this change.

However, the requirements in Section 3004.4 are still valid. With the deletion of Section 3004, these provisions need to be relocated. Section 3002 is titled "Hoistway Enclosures," and these provisions restricting what can be located in an elevator hoistway enclosure fit neatly within that subject matter. It can be argued that they never belonged in Section 3004 to begin with, since they do not relate to hoistway vents.

Cost Impact: The code change proposal will not increase the cost of construction.

G166-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3004-G-SIU.doc

G167 – 12
3004.1

Proponent: Michael Perrino, CBO, Code Consultants, Inc., representing self

Revise as follows:

3004.1 Vents required. Hoistways of elevators and dumbwaiters penetrating more than three *stories* shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.

Exception: Venting is not required for the following elevators and hoistways:

1. In occupancies of other than Groups R-1, R-2, I-1, I-2 and similar occupancies with overnight *sleeping units*, where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Sidewalk elevator hoistways.
3. Elevators contained within and serving *open parking garages* only.
4. Elevators within individual residential *dwelling units*.
5: Elevator hoistways that are pressurized in accordance with Section 909.21.

Reason: The intent of the hoistway venting is to limit smoke spread to upper stories of a building via elevator hoistways. Elevator hoistway pressurization systems have been introduced to the IBC within the past 10 years that provide a means of limiting smoke movement into elevator hoistways.

The concept of the elevator hoistway pressurization is to create a pressure difference between the floor of fire origin and the elevator hoistway to minimize smoke movement into the elevator hoistway. Because the pressurization system limits smoke movement into the elevator hoistway, the hoistway venting to remove smoke in the shaft is not necessary.

The installation of both a hoistway pressurization system and hoistway venting increases the required capacity of the pressurized air to compensate for the air lost through the hoistway vent. The installation of hoistway venting in a pressurized hoistway also increases the complexity of the pressurization system, because the system must compensate for an open or closed hoistway vent.

Cost Impact: The code change proposal will not increase the cost of construction.

G167-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3004.1-G-PERRINO.doc

G168 – 12

PART 1 – INTERNATIONAL BUILDING CODE
Table 1607.1, 3004.2, 3006.1 through 3006.5, 3007.2, 3007.3.1, 3007.7.3, 3008.3.1, 3008.7.3, 3008.8, 3008.9.1
PART II – INTERNATIONAL FIRE CODE
IFC 903.3.1.1.1, 907.2.13.1.1, 911.1.5 (IBC [F] 903.3.1.1.1, [F] 907.2.13.1.1, [F] 911.1.5)

Proponent: Brian Black, BDSBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC GENERAL COMMITTEE.

PART I – INTERNATIONAL BUILDING CODE - GENERAL

Revise as follows:

3004.2 Location of vents. Vents shall be located at the top of the hoistway and shall open either directly to the outer air or through noncombustible ducts to the outer air. Noncombustible ducts shall be permitted to pass through ~~the~~ elevator machine rooms and control rooms, provided that portions of the ducts located outside the hoistway, ~~or~~ machine room, or control room are enclosed by construction having not less than the *fire-resistance rating* required for the hoistway. Holes in the machine room and control room floors for the passage of ropes, cables or other moving elevator equipment shall be limited as not to provide greater than 2 inches (51 mm) of clearance on all sides.

3006.1 Access. An *approved* means of access shall be provided to elevator machine rooms, control rooms, control spaces, and ~~overhead~~ machinery spaces.

3006.2 Venting. Elevator machine rooms, and machinery spaces that contain the driving machine, and control rooms or control spaces that contain the operation or motion controller, ~~solid state equipment~~ for elevator operation shall be provided with an independent *ventilation* or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be capable of maintaining temperatures within the range established for the elevator equipment.

3006.3 Pressurization. The elevator machine room, control rooms, or control space with openings into ~~serving~~ a pressurized elevator hoistway shall be pressurized upon activation of a *heat or smoke detector* located in the elevator machine room, control room, or control space.

3006.4 Machine rooms, control rooms ~~and~~ machinery spaces, and control spaces. Elevator machine rooms, control rooms, control spaces, and machinery outside of but attached to a hoistway that have openings into the hoistway spaces shall be enclosed with *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the *fire barriers* shall be protected with assemblies having a *fire protection rating* not less than that required for the hoistway enclosure doors.

Exceptions:

1. Where machine rooms, ~~and~~ machinery spaces, control rooms and control spaces do not abut and have no openings to the hoistway enclosure they serve the *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour *fire resistance rating*.

2. In buildings four *stories* or less above *grade plane* where machine room, ~~and~~ machinery spaces, control rooms and control spaces do not abut and have no openings to the hoistway enclosure they serve, the machine rooms, ~~and~~ machinery spaces, control rooms and control spaces are not required to be fire-resistance rated.

3006.5 Shunt trip. Where elevator hoistways, ~~or~~ elevator machine rooms, control rooms and control spaces containing elevator ~~control~~ equipment are protected with automatic sprinklers, a means installed in accordance with NFPA 72, Section 6.16.4, Elevator Shutdown, shall be provided to disconnect automatically the main line power supply to the affected elevator prior to the application of water. This means shall not be self-resetting. The activation of sprinklers outside the hoistway, ~~or~~ machine room, machinery space, control room, or control spaces shall not disconnect the main line power supply.

3007.2 Phase I Emergency recall operation. Actuation of any building fire alarm initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position key-operated “Fire Recall” switch or automatically initiated by the associated elevator lobby, hoistway, ~~or~~ elevator machine room, machinery space containing a motor controller or electric driving machine, control space, or control room *smoke detectors*. In addition, if the building also contains occupant evacuation elevators in accordance with Section 3008, an independent, three-position, key-operated “Fire Recall” switch conforming to the applicable requirements in ASME A17.1/CSA B44 shall be provided at the designated level for each fire service access elevator.

3007.3.1 Prohibited locations. Automatic sprinklers shall not be installed in elevator machine rooms, ~~elevator machine~~ machinery spaces, control rooms, control spaces, and elevator hoistways of fire service access elevators.

3007.7.3 Lobby doorways. Other than ~~the~~ door to the hoistway, each doorway to a fire service access elevator lobby shall be provided with a 3/4-hour *fire door assembly* complying with Section 716.5. The *fire door assembly* shall also comply with the smoke and draft control door assembly requirements of Section 716.5.3.1 with the UL 1784 test conducted without the artificial bottom seal.

3008.3.1 Prohibited locations. Automatic sprinklers shall not be installed in elevator machine rooms, ~~and elevator machine~~ machinery spaces, control rooms, control spaces, and elevator hoistways of for occupant evacuation elevators.

3008.7.3 Lobby doorways. Other than ~~the~~ doors to the hoistway, and elevator machine rooms, machinery spaces, control rooms, and control spaces within the lobby enclosure smoke barrier, each doorway to an occupant evacuation elevator lobby shall be provided with a 3/4-hour *fire door assembly* complying with Section 716.5. The *fire door assembly* shall also comply with the smoke and draft control assembly requirements of Section 716.5.3.1 with the UL 1784 test conducted without the artificial bottom seal.

3008.8 Elevator system monitoring. The occupant evacuation elevators shall be continuously monitored at the *fire command center* or a central control point *approved* by the fire department and arranged to display all of the following information:

1. Floor location of each elevator car.
2. Direction of travel of each elevator car.
3. Status of each elevator car with respect to whether it is occupied.
4. Status of normal power to the elevator equipment, elevator machinery and electrical apparatus ~~controller~~ cooling equipment where provided, ~~and~~ elevator machine room, control room and control space *ventilation* and cooling equipment.
5. Status of standby or emergency power system that provides backup power to the elevator equipment, elevator machinery and electrical ~~controller~~ cooling equipment where provided, ~~and~~ elevator machine room, control room and control space *ventilation* and cooling equipment.

6. Activation of any fire alarm initiating device in any elevator lobby, elevator machine room, ~~or~~ machine space containing a motor controller or electric driving machine, control space, control room, or elevator hoistway.

3008.9.1 Protection of wiring or cables. Wires or cables that are located outside of the elevator hoistway, ~~and~~ machine room, control room and control space and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, *ventilation* and fire-detecting systems to fire service access elevators shall be protected by construction having a *fire-resistance rating* of not less than 2 hours, or shall be circuit integrity cable having a *fire resistance rating* of not less than 2 hours.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operation.

Revise as follows:

1607.3 Uniform live loads. The live loads used in the design of buildings and other structures shall be the maximum loads expected by the intended use or occupancy but shall in no case be less than the minimum uniformly distributed live loads given in Table 1607.1.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o,
AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	Concentrated (lbs)
11. Elevator machine room and control room grating (on area of 2 inches by 2 inches)	--	300

(Portions of table not shown remain unchanged)

PART II – INTERNATIONAL FIRE CODE

Revise as follows:

IFC 903.3.1.1 (IBC [F] 903.3.1.1) NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an *automatic sprinkler system* in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.

IFC 903.3.1.1.1 (IBC [F] 903.3.1.1.1) Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an *approved* automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when *approved* by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a *fire-resistance rating* of not less than 2 hours.
4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevator machine rooms and machinery spaces.
6. Machine rooms, ~~and~~ machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008.

IFC 907.2.13.1.1 (IBC [F] 907.2.13.1.1) Area smoke detection. Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall activate the emergency voice/alarm communication system in accordance with Section 907.5.2.2. In addition to smoke detectors required by Sections 907.2.1 through 907.2.10, smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection.
2. In each elevator machine room, machinery space, control room and control space and in elevator lobbies.

IFC 911.1.5 (IBC [F] 911.1.5) Required features. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. through 12. *(no change)*
13. An *approved* Building Information Card that contains, but is not limited to, the following information:
    13.1 *(no change)*
    13.2 *(no change)*
    13.3 *(no change)*
    13.4. *Exit stair* information that includes: number of *exit stairs* in building, each *exit stair* designation and floors served, location where each *exit stair* discharges, *exit stairs* that are pressurized, *exit stairs* provided with emergency lighting, each *exit stair* that allows reentry, *exit stairs* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine room~~s~~, control rooms, control spaces, location of sky lobby, location of freight elevator banks;
    13.5 *(no change)*
    13.6 *(no change)*
    13.7 *(no change)*
14. through 18. *(no change)*

Reason: The ASME A17.1 *Safety Code for Elevators and Escalators* underwent a substantial revision in 2005 to incorporate requirements for Machine Room-Less elevators (MRLs). These provisions are in ASME A17.1-2007/CSA B44-07 with A17.1a-2008/CSA B44a-08 Addenda that is referenced in Chapter 35 of the 2012 IBC.
ASME A17.1 has definitions for elevator rooms and spaces that may contain various elevator apparatus, and has terminology for certain elevator electrical apparatus. Key concepts include:

- A room outside the hoistway with an elevator machine is a ***machine room***;
- A room or space outside the hoistway with a motor controller and not a machine is a ***control room*** or ***control space***;
- Where a machine and motor controller are located inside the hoistway, the hoistway is a ***machinery space***;
- Machinery and control spaces may have doors;
- Elevator controllers include the operation controller and motion controller that may be separated from the location of the elevator machine and be located in separate elevator rooms and spaces;
- Machine rooms and controls rooms are full body spaces with doors that may have room sprinklers and fire detection apparatus; control and machinery spaces typically would not;
- Machine rooms and control rooms typically require room ventilation and cooling, machinery and control spaces typically do not;
- Machinery spaces inside the hoistway are covered by the code's hoistway requirements;.
- Elevator machines and electrical apparatus in spaces other than the hoistway or rooms may require standby power for apparatus cooling equipment.

Thus, MRL design has resulted in elevators machines and controllers being located in rooms or spaces other than the traditional machine rooms regulated by the IBC. This code change simply harmonizes the current IBC text with the nomenclature now used in ASME A17.1/CSA B44 to ensure that the same level of protection is provided to MRLs as is provided for traditional elevators with machine rooms.

Cost Impact: This code change proposal will not increase the cost of construction.

G168-12
PART I – INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL FIRE CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3004.2-G-BLACK.doc

G169 – 12
3004.4(New)

Proponent: Randall R. Dahmen, PE, WI licensed Commercial Building Inspector, representing himself (randy.dahmen@wi.gov)

Revise as follows:

3004.4 Vent controls. Vents shall require an OPEN-AUTO-CLOSE control over individual dampers. The control shall be lockable or located behind a locked cover with the key being a standard type carried by fire-fighters. The control shall be located as follows:

1. In the fire command center where a fire command center is provided.
2. In buildings without a fire command center, controls shall located at the designated level adjacent to the elevator stand-by power indicator where provided, or adjacent to the Phase I recall key switch.

(Renumber subsequent sections).

Reason: The 2012 IBC does not provide the user any direction on where the vent control is to be located or how it should function.

Cost Impact: The code change proposal will increase the cost of construction.

G169-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3004.X (NEW)-G-DAHMEN

G170 – 12
3006.4

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the *fire barriers* shall be protected with assemblies having a *fire protection rating* not less than that required for the hoistway enclosure doors.

Exceptions:

1. Except for fire service access elevators, ~~W~~where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour *fire-resistance rating*.
2. In buildings four *stories* or less above *grade plane* where machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces are not required to be fire-resistance rated.

Reason: It is critical to protect Fire Service Access Elevator systems by keeping heat from reaching the solid-state equipment and associated wiring/equipment located in machine rooms and machinery spaces. The reduction in Exception 1 to permit a 1-hour fire-resistance rating defeats this need.

Cost Impact: The code change proposal will increase the cost of construction.

G170-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3006.4-G-BLACK

G171 – 12
3006.4

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the *fire barriers* shall be protected with assemblies having a *fire protection rating* not less than that required for the hoistway enclosure doors.

Exceptions:

1. For other than fire service access elevators and occupant evacuation elevators, where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour *fireresistance rating*.
2. For other than fire service access elevators and occupant evacuation elevators, in buildings four *stories* or less above *grade plane* where machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces are not required to be fire-resistance rated.

Reason: Section 903.3.1.1.1, items 5 and 6 prohibit sprinklers in machine rooms of fire service access elevators and occupant evacuation elevators. Thus, they are unprotected. As such, they should not be allowed a reduction in enclosure protection.

Alternate proposal:

In lieu of the change above, make the following change:

IBC Section 3006.4, delete the two exceptions.

And:

Group B cycle, IFC/IBC Section 903.3.1.1.1 amend item 5 and 6 as follows:

5. ~~Fire service access~~ elevator machine rooms and machinery spaces.
6. ~~Machine rooms and machinery spaces associated with occupant evacuation elevators designed in accordance with Section 3008.~~

Reason: Just treat all elevator machine rooms the same. No sprinklers. No reduction in construction.

Cost Impact: This code change proposal will increase the cost of construction in not allowing the reduction in the construction rating of elevator machine rooms.

G171-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3006.4-G-GODWIN

G172 – 12
3006.4, 3006.4.1 (NEW)

Proponent: Lynn W Manley, Illinois Department of Public Health – Health Care Facilities and Programs, representing self.

Revise as follows:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the *fire barriers* shall be protected with assemblies having a *fire protection rating* not less than that required for the hoistway enclosure doors.

~~**Exceptions:**~~

1. ~~Where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour *fire resistance rating*.~~
2. ~~In buildings four *stories* or less above *grade plane* where machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces are not required to be fire-resistance rated.~~

<u>**3006.4.1 Separated Elevator Machine Rooms.** Where more than one hoistway is required under Section 3002.2, the elevator machine room that is open to each hoistway shall be separated from other elevator machine rooms by fire rated barriers The fire rated separation for the machine rooms shall match the requirements of the hoistways.</u>

<u>**Exceptions:**</u>

1. <u>Where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, shall be permitted to be reduced to a 1-hour *fire resistance rating*.</u>
2. <u>In buildings four *stories* or less above *grade plane* where machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces are not required to be fire-resistance rated.</u>

Reason: Section 3002 limits the number of elevators in a shaft to four. Where more than four elevators are provided, separate shall enclosures are required. In many cases all elevator shafts are open to one common elevator machine room. These machine rooms are required to be sprinklered in new construction. ANSI/ASME A17.3, NFPA and ICC all require Phase I emergency recall and require smoke detection in the elevator machine room. Where sprinkler protection is provided, machine rooms are also required to have shunt trip relays and heat detection that is designed to shut down the elevators before any sprinkler head in the machine room activates.

This means that <u>all elevators</u> that are part of or open to the same machine room will recall to the designated floor from activation of any smoke detector in the machine room. This is not desirable in high rise buildings and it is not desirable in most hospitals.

Further, any activation of a heat detector in the elevator machine room will shut down every elevator served by that machine room. It is not desirable to lose every elevator in a building due a fire in a common machine rooms.

Recall and/or shut down should only occur if the elevator shaft and the machine room that serves that shaft have a fire. If the machine rooms are isolated by fire barriers, some elevator could remain in use because they are unaffected by the fire.

Cost impact: There will be no cost impact in many buildings where the change will not require anything new. There will be a slight cost increase in buildings with multiple elevator shafts. The cost of a fire barrier is negligible compared to the increased safety provided.

G172-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3006.4.1 (NEW)-G-MANLEY.doc

G173 – 12
3007.2

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Delete without substitution:

~~**3007.2 Phase I Emergency recall operation.** Actuation of any building fire alarm-initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position, key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby, hoistway or elevator machine room *smoke detectors*. In addition, if the building also contains occupant evacuation elevators in accordance with Section 3008, an independent, three-position, key-operated "Fire Recall" switch conforming to the applicable requirements in ASME A17.1/CSA B44 shall be provided at the designated level for each fire service access elevator.~~

Reason: The first sentence makes no sense because ASME A17.1/CSA B44 requires Phase I emergency recall operation only when a fire alarm initiating device is activated in an elevator lobby, hoistway, or associated elevator machine room, machinery space containing a motor controller or electric driving machine, control space, or control room. The activation of any alarm initiating device in a building activating Phase I on any elevator does not comply with ASME A17.1/CSA B44.

Just as important, this activation of Phase I in a building equipped with Occupant Evacuation Elevators complying with Section 3008 would unnecessarily compromise the evacuation capacity of the elevator system for no good reason. The firefighters responding to a building fire can capture the fire service access elevators when they get there if it is needed.

With the deletion of the first sentence, none of the rest of this section is necessary as these functions are already addressed in ASME A17.1/CSA B44 or the Occupant Evacuation Elevator requirements of Section 3008.

Cost Impact: The code change will not increase the cost of construction.

G173-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.2-G-BLACK

G174 – 12
PART 1 – IBC GENERAL
3007.7, 3007.7.1, 3007.7.5 (NEW), 3007.7.6 (NEW),
Part II – IBC GENERAL
3008.7, 3008.7.1, 3008.7.5 (NEW)
PART III – IBC FIRE SAFETY
713.14.1.2 (NEW)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering, (al.godwin@aon.com)

THIS IS A 3 PART CODE CHANGE. PARTS I AND II WILL BE HEARD BY THE IBC GENERAL COMMITTEE AND PART III WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

PART I - IBC GENERAL

Revise as follows:

3007.7 Fire service access elevator lobby. The fire service access elevator shall open into a fire service access elevator lobby in accordance with Sections 3007.7.1 through ~~3007.7.5~~ 3007.7.7.

> ~~**Exception:** Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to open into an elevator lobby in accordance with Section 708.14.1.~~

The fire service access elevator lobby shall be permitted to be one of the following:

1. A private lobby from the fire service access elevator in which the elevator is dedicated to this use only.
2. A private lobby on the side or rear of a public or freight elevator which has two entrances onto a floor. The second entrance shall be permitted to open into an elevator lobby in accordance witgh Section 713.14.1.
3. The public or freight elevator lobby when constructed in accordance with this Section. The lobby exceptions of Section 713.14.1 shall not be applicable except as specified in Section 3007.7.2.

3007.7.1 Access. The fire service access elevator lobby shall have direct access to an enclosure for an *interior exit stairway*.

> **Exception:** Direct access shall be permitted through an *exit passageway*, used only as an *exit* in accordance with Section 1023 that directly connects the lobby to the *interior stairway*, is not also used as a corridor, and has no other entry doors except those that are used as a *means of egress*.

3007.7.5 Connections with corridors and other rooms. Corridors shall be permitted to pass through the fire service access elevator lobby when the connecting walls and doors are constructed in accordance with this section.

> **Exception:** In Group I-2 occupancies and ambulatory healthcare facilities, connecting doors for a corridor passing through the lobby need not have latching hardware when in compliance with Section 709.5.

Other rooms or spaces, other than those associated with fire service uses, shall not have doors directly connected to the fire service access elevator lobby.

3007.7.6 Storage and furniture. Fire service access elevator lobbies shall be maintained free of storage and furniture.

(Renumber subsequent sections)

PART II – IBC GENERAL

3008.7 Occupant evacuation elevator lobby. The occupant evacuation elevators shall open into an elevator lobby in accordance with Sections 3008.7.1 through ~~3008.7.7~~ 3008.7.8.

3008.7.1 Access. The occupant evacuation elevator lobby shall have direct access to an *interior exit stairway* or *ramp*.

> **Exception:** Direct access shall be permitted to be through the use of an *exit passageway*, used only as an *exit* in accordance with Section 1023 that directly connects the lobby to the *interior stairway*, is not also used as a corridor, and has no other entry doors except those that are used as a *means of egress*

3008.7.5 Connections with corridors and other rooms. Corridors shall be permitted to pass through the occupant evacuation elevator lobby when the connecting walls and doors are constructed in accordance with this section.

> **Exception:** In Group I-2 occupancies and ambulatory healthcare facilities, connecting doors for a corridor passing through the lobby need not have latching hardware when in compliance with Section 709.5.

Other rooms or spaces, other than those associated with fire service uses, shall not have doors directly connected to the occupant evacuation elevator lobby.

(Renumber subsequent sections)

PART III - IBC FIRE SAFETY

Revise as follows:

713.14.1.2 Connections with corridors and other rooms. When a lobby or smoke partitions of Exception 5 in Section 713,14,1, is constructed, corridors shall be permitted to pass through the elevator lobby when the connecting walls and doors are constructed in accordance with this section.

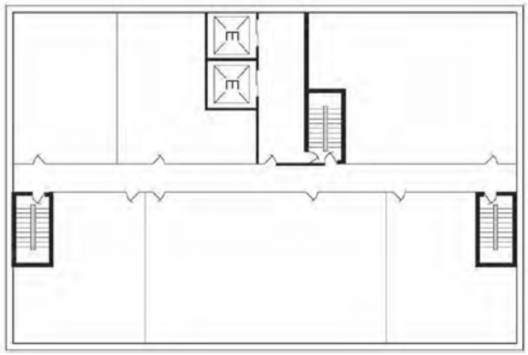
> **Exception:** In Group I-2 occupancies and ambulatory health care facilities, connecting doors for a corridor passing through the lobby need not have latching hardware when in compliance with Section 709.5.

Other rooms or spaces shall be permitted to have doors directly connected to the lobby.

Reason: Part I: During the last code cycle, code change FS45-09/10 was submitted to restrict exiting through a passenger elevator lobby. It was withdrawn after public comments were submitted against it claiming that it was an exiting issue and not a fire safety issue.

This proposal is being submitted as a fire safety issue for clarification as to the fire safety construction of fire service access elevator lobbies and occupant evacuation elevator lobbies. While passenger elevator lobbies may end up as part of the discussion, the first point of clarification is for fire service access elevator lobbies.

When originally submitted, the exception to Section 3007.7 gave the impression that the fire service access elevator lobby was a private dedicated elevator lobby. When G49-09/10 passed, requiring "two" fire service access elevators, it virtually guaranteed that the public lobby would be used as the fire service access lobby. This was further confirmed when G164-09/10 was passed using the following drawing:



With multiple lobby changes happening (fire service access elevator lobbies, occupant evacuation lobbies, which are now tied to passenger lobbies) it is time the sections were correlated. And, how does section 709.5, allowing the removal of hardware fit into all of this?

There are commentary notes about public elevator lobbies that may or may not be applicable when used as the fire service access lobby. Thus, this submittal is to generate discussion as to what is or is not applicable.

Specific sections are explained as follows:

Section 3007.7, options 1 thru 3. These now appears to be the design options available.

Section 3007.7.1. Now that two elevators are required, it is likely that the main elevator lobby in the center of the building will be the option of choice as shown in G164-09/10. As such, it may not be feasible to install an extra stair in the center of the building, or bring over one of the original stairs and still meet code for dead end corridors. Therefore, direct connection from the lobby to the stair with the use of an exit passageway seems to be an appropriate option.

Section 3007.7.5. The commentary allows corridors to pass through a lobby and it allows other rooms to have direct access to and/or through the lobby. The commentary states:

"Egress through elevator lobbies from corridors on both sides is also allowed.

Two questions arise. One, can a space have its only exit access path through an elevator lobby? The answer is yes, if it meets all the other egress requirements. Second, can an exit enclosure open into and elevator lobby? The answer is yes. An elevator lobby is a normally occupied space in the same manner that a corridor is a normally occupied space."

If the above mentioned commentary notes are not deemed appropriate for passenger lobbies, then an amendment to Section 713.14.1 may be needed to correct the commentary.

However, as long as applicable, the following might also apply to the Fire Service Access lobby:

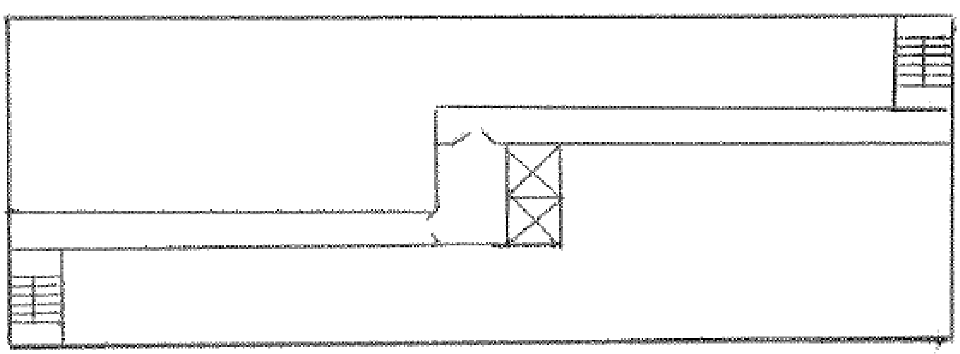
Allowing the corridor to pass through a fire service access lobby, when properly protected, would not seem to add any extra hazard than crossing across the front of a lobby as shown in G164 above. The exception for Group I-2's and ambulatory health care needs to be evaluated.

However, is does not seem appropriate to have extra rooms directly connected to the fire service access lobby, even if separated, that would exit through the lobby and perhaps into the directly connected interior stair.

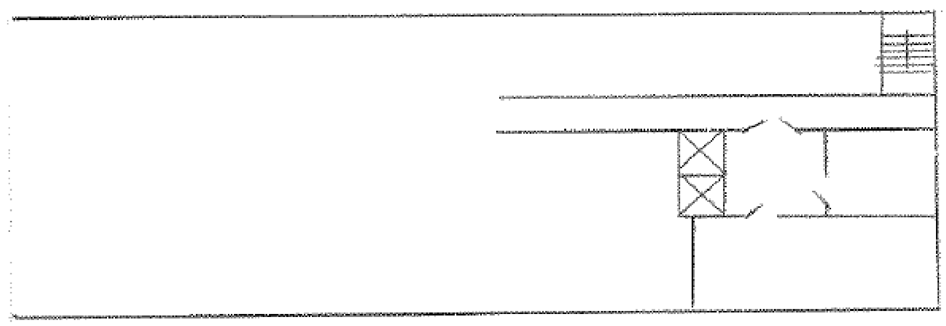
Section 3007.7.6. This is from IFC Section 607.3.

Some examples are as follows:

1. Corridor passes through passenger elevator lobby. If provided with access to a stair and proper construction, could this be a Fire Service Access Elevator Lobby and/or an Occupant Evacuation Elevator Lobby?



2. Rooms connect to and exit through elevator lobby. If provided with access to a stair and correct construction, could this be a Fire Service Access Elevator Lobby and/or an Occupant Evacuation Elevator Lobby?



Even the commentary has an example of what appear to be restrooms off an elevator lobby as follows:

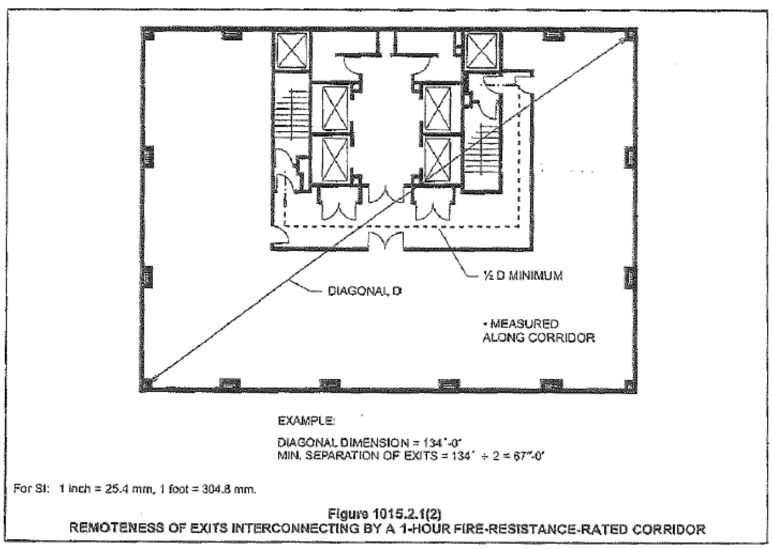
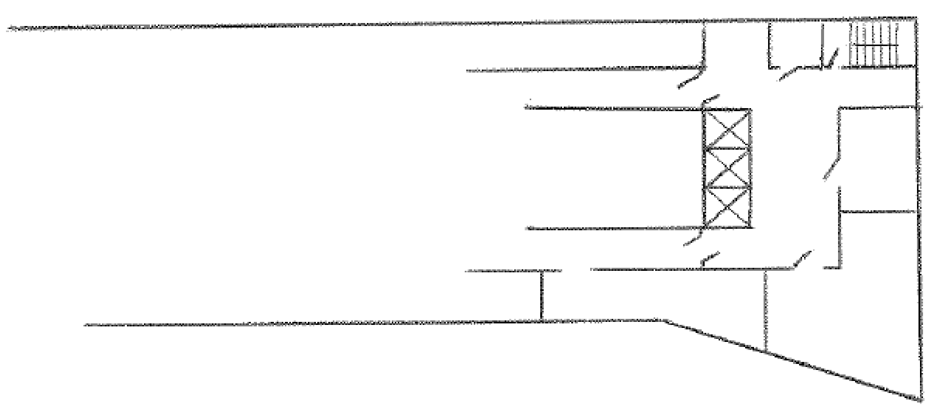


Figure 1015.2.1(2)
REMOTENESS OF EXITS INTERCONNECTING BY A 1-HOUR FIRE-RESISTANCE-RATED CORRIDOR

3. The following is an example of corridors passing through a lobby, along with rooms with direct connection to lobby, serving as passenger elevator lobby Fire Service Access lobby and/or Occupant Evacuation Elevator lobby. This is an actual design submitted for review.



When this discussion concludes, there should be a clear definition of what is required for lobby protection.

Part II

Part II is actually a place holder. Depending on how the discussions proceed on Part I, amendments may be needed on Part II. By listing this section in the code change, it will allow them to be made.

My personal opinion is that the elevator lobby should be a separated alcove off of the side with only a corridor going across the entry way as shown in the drawing under Part I above. However, the commentary allows corridors to pass through a lobby and it allows other rooms to have direct access to and/or through the lobby. The commentary states:

"Egress through elevator lobbies from corridors on both sides is also allowed.

Two questions arise. One, can a space have its only exit access path through an elevator lobby? The answer is yes, if it meets all the other egress requirements. Second, can an exit enclosure open into and elevator lobby? The answer is yes. An elevator lobby is a normally occupied space in the same manner that a corridor is a normally occupied space."

In order to specifically achieve the alcove as shown in the drawing above, it would seem that extra wording is required.

Part III

Part III is actually a place holder. Depending on how the discussions proceed on Part I, amendments may be needed on Part III. By listing this section in the code change, it will allow them to be made.

My personal opinion is that the elevator lobby should be a separated alcove off of the side with only a corridor going across the entry way as shown in the drawing under Part I below. However, the commentary allows corridors to pass through a lobby and it allows other rooms to have direct access to and/or through the lobby. The commentary states:

"Egress through elevator lobbies from corridors on both sides is also allowed.

Two questions arise. One, can a space have its only exit access path through an elevator lobby? The answer is yes, if it meets all the other egress requirements. Second, can an exit enclosure open into and elevator lobby? The answer is yes. An elevator lobby is a normally occupied space in the same manner that a corridor is a normally occupied space."

In order to specifically achieve the alcove as shown in the drawing above, it would seem that extra wording is required.

Cost Impact: This code change proposal will increase the cost of construction if the intent was to allow such penetrations of all lobbies and this restricts such penetrations.

G174-12

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.7-G-GODWIN.doc

G175 – 12
202, 1027.1, 3007.7.1, 3008.7.1

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

3007.7.1 Interior exit stairway access. The fire service access elevator lobby shall have direct access from the enclosed elevator lobby to an enclosure for an *interior exit stairway*.

> **Exception:** Access to an interior exit stairway shall be permitted to be through a protected path of travel that has a level of fire protection not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly in accordance Section 716.5.3.

3008.7.1 Interior exit stairway access. The occupant evacuation elevator lobby shall have direct access from the enclosed elevator lobby to an *interior exit stairway* or *ramp*.

> **Exception:** Access to an interior exit stairway shall be permitted to be through a protected path of travel that has a level of fire protection not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke and draft control assembly in accordance Section 716.5.3.

1027.1 General. *Exits* shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide a direct ~~access~~ path of egress travel to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and capacity of the required exits.

Exceptions:

1., 2., and 3, *(Portions of text not shown remain unchanged)*

Add new definition as follows:

DIRECT ACCESS. A path of travel from a space to an immediately adjacent space through an opening in the common wall between the two spaces.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is one of several proposals submitted by the CTC related to elevator lobby provisions. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- ☐ Review the need for elevator lobbies,~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- ☐ Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- ☐ Review related code provisions, such as egress from and through elevator lobbies.
- ☐ Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- ☐ Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.

☐ Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.

☐ Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

The focus of this proposal is on how the direct access requirements of Section 3007.7.1 and 3008.7.1 are applied. Both FSAE and Occupant Evacuation elevators lobbies call for direct access to the stairway. The term direct access is not necessarily clear in its meaning and could if applied as intended place severe design limitations on some buildings. The intent of this proposal is to set out a viable option for the stairs to be more remotely located from the lobby. A package of requirements that provides fire resistance rated construction and smoke and draft protection is provided. A definition is also provided to clarify the use of the term. Section 1027.1 was revised slightly since the current use of the term "direct access" in that case has a different meaning.

Background sections for the separation requirements are as follows:

708.1 General. The following wall assemblies shall comply with this section.

1. Walls separating *dwelling units* in the same building as required by Section 420.2.
2. Walls separating *sleeping units* in the same building as required by Section 420.2.
3. Walls separating tenant spaces in *covered and open mall buildings* as required by Section 402.4.2.1.
4. Corridor walls as required by Section 1018.1.
5. Elevator lobby separation as required by Section 713.14.1.

708.2 Materials. The walls shall be of materials permitted by the building type of construction.

708.3 Fire-resistance rating. Fire partitions shall have a *fire resistance rating* of not less than 1 hour.

Exceptions:

1. Corridor walls permitted to have a 1/2 hour *fire-resistance rating* by Table 1018.1.
2. *Dwelling unit* and *sleeping unit* separations in buildings of Type IIB, IIIB and VB construction shall have *fire-resistance ratings* of not less than 1/2 hour in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

716.5.3 Door assemblies in corridors and smoke barriers. *Fire door* assemblies required to have a minimum *fire protection rating* of 20 minutes where located in *corridor* walls or *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.5 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has at least one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit* passageway.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.3 and 408.8.4 in occupancies in Group I-3.

716.5.3.1 Smoke and draft control. *Fire door* assemblies shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 m3/s □□ m2)of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

716.5.3.2 Glazing in door assemblies. In a 20-minute *fire door assembly*, the glazing material in the door itself shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lights and sidelights, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 716.6.

Background information on the term "direct access" is as follows:

ANCHOR BUILDING. An exterior perimeter building of a group other than H having direct access to a *covered or open mall building* but having required *means of egress* independent of the mall.

405.4.3 Elevators. Where elevators are provided, each compartment shall have direct access to an elevator. Where an elevator serves more than one compartment, an elevator lobby shall be provided and shall be separated from each compartment by a s*moke barrier* in accordance with Section 709. Doors shall be gasketed, have a drop sill and be automatic-closing by smoke detection in accordance with Section 716.5.9.3.

407.4.1 Direct access to a corridor. Habitable rooms in Group I-2 occupancies shall have an *exit access* door leading directly to a *corridor*.

505.2.3 Openness. A *mezzanine* shall be open and unobstructed to the room in which such *mezzanine* is located except for walls not more than 42 inches (1067 mm) in height, columns and posts.

Exceptions:

1. *Mezzanines* or portions thereof are not required to be open to the room in which the *mezzanines* are located, provided that the *occupant load* of the aggregate area of the enclosed space is not greater than 10.
2. A *mezzanine* having two or more *means of egress* is not required to be open to the room in which the *mezzanine* is located if at least one of the *means of egress* provides direct access to an *exit* from the *mezzanine* level.
3. …

1007.6 Areas of refuge. Every required *area of refuge* shall be *accessible* from the space it serves by an *accessible means of egress*. The maximum travel distance from any *accessible* space to an *area of refuge* shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required *area of refuge* shall have direct access to a *stairway* complying with Sections 1007.3 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an *area of refuge*, the shaft and lobby shall comply with Section 1022.10 for smokeproof enclosures except where the elevators are in an *area of refuge* formed by a *horizontal exit* or smoke barrier.

1007.7.2 Outdoor facilities. Where *exit access* from the area serving outdoor facilities is essentially open to the outside, an exterior area of assisted rescue is permitted as an alternative to an *area of refuge*. Every required exterior area of assisted recue shall have direct access to an *interior exit stairway*, exterior *stairway*, or elevator serving as an *accessible means of egress* component. The exterior area of assisted rescue shall comply with Sections 1007.7.3 through 1007.7.6 and shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

1027.1 General. *Exits* shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide direct access to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and capacity of the required exits.

1105.1.1 Parking garage entrances. Where provided, direct access for pedestrians from parking structures to buildings or facility entrances shall be *accessible*.

1105.1.2 Entrances from tunnels or elevated walkways. Where direct access is provided for pedestrians from a pedestrian tunnel or elevated walkway to a building or facility, at least one entrance to the building or facility from each tunnel or walkway shall be *accessible*.

TABLE 2902.1
c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.

3007.7.1 Access. The fire service access elevator lobby shall have direct access to an enclosure for an *interior exit stairway*.

3008.7.1 Access. The occupant evacuation elevator lobby shall have direct access to an *interior exit stairway* or *ramp*.

3109.4.1.8 Dwelling wall as a barrier. Where a wall of a *dwelling* serves as part of the barrier, one of the following shall apply:

1. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be *listed* and labeled in accordance with UL 2017. In dwellings not required to be *Accessible units*, *Type A units* or *Type B units*, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be *Accessible units*, *Type A units* or *Type B units*, the deactivation switch shall be located not higher than 54 inches (1372 mm) and not less than 48 inches (1219 mm) above the threshold of the door.

This proposal does not have any particular correlation concerns. See discussion on CTC elevator lobby proposal coordination in code change Section 713.14.1.

Cost Impact: This proposal will not increase the cost of construction.

G175-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.7.1-G-BALDASSARRA-CTC.doc

G176 – 12
3007.7.3

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3007.7.3 Lobby doorways. Other than ~~the~~ doors to the hoistway, elevator control room, or elevator control space, each doorway to a fire service access elevator lobby shall be provided with a 3/4-hour *fire door assembly* complying with Section 716.5. The *fire door assembly* shall also comply with the smoke and draft control door assembly requirements of Section 716.5.3.1 with the UL 1784 test conducted without the artificial bottom seal.

Reason: Machine Room Less (MRL) elevators permitted by ASME A17.1/CSA B44 typically have control rooms or control spaces that are accessed by a door immediately adjacent to a hoistway opening in an elevator lobby.

3007.7.3 is intended to maintain the integrity of the lobby enclosure smoke barrier and the lobby's separation from the remaining floor area on a building floor (see 3007.7.2). This ensures that smoke from another area on the floor will not reach the lobby smoke detectors and place the elevator(s) into Phase I, thus rendering them unusable for Fire Service Access.

Smoke and draft control is unnecessary on elevator control room or space doors because any smoke emanating from those spaces has already activated the smoke detector in the control room/space and placed the elevator(s) in Phase I operation. It is thus unnecessary to protect the lobby smoke detector from smoke originating in the control room/space (or the hoistway to which the room/space is connected).

The ASME A17 Firefighters and Occupant Egress Task Groups that performed the hazard analyses that resulted in Fire Service Access Elevators did not discuss MRL elevators in their initial analyses that led to the current IBC requirements, and thus did not anticipate the problem of control room and control space doors opening into a lobby enclosure.

Cost Impact: This code change proposal will not increase the cost of construction.

G176-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.7.3-G-BLACK

G177 – 12
3007.7.4

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

3007.7.4 Lobby size. ~~Each~~ Regardless of the number of fire service access elevators served by the same elevator lobby the enclosed fire service access elevator lobby shall be a not less than 150 square feet (14 m^2) in an area with a minimum dimension of 8 feet (2440 mm).

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is one of several proposals submitted by the CTC related to elevator lobbies. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- ☐ Review the need for elevator lobbies,~~;~~ with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- ☐ Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- ☐ Review related code provisions, such as egress from and through elevator lobbies.
- ☐ Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- ☐ Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- ☐ Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- ☐ Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

This proposal is to clarify that it was not the intent to require additional space for each additional fire service access elevator provided. The initial intent of the size requirement was merely to provide sufficient space to conduct fire fighting operations. The 2012 IBC has a new requirement for a second fire service access elevator which was not related to the section on lobby size. This second elevator was initially discussed as being needed for additional capacity but when discussed on the floor was noted as being more for redundancy.

The current size requirement is the result of a successful Public Comment to Code Change G197-07/08 submitted by the proponent representing the Los Angeles Fire Department. The proponent originally wanted 50 square feet for each additional elevator car served by the lobby but that was disapproved by the General Committee. The Public Comment deleted the 50 square feet and added the minimum dimension requirement of 8 feet. A detailed rationale for that approach can be found in the Commenter's Reason submitted with the Public Comment. So this proposed code change implements and clarifies the intent of the Public Comment that was approved by the ICC governmental voting representatives.

This proposal will not need correlation with other CTC Elevator lobby proposals. See discussion on CTC elevator lobby proposal coordination in the FS code change to Section 713.14.1 that changes the criteria for when elevator lobbies would be required.

Cost Impact: There will be no increase in the cost of construction.

G177-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.7.4-G-BALDASSARRA-CTC.doc

G178 – 12
3007.7.5, Figure 3007.7.5

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3007.7.5 Fire service access elevator symbol. A pictorial symbol of a standardized design designating which elevators are fire service access elevators shall be installed on each side of the hoistway door frame on the portion of the frame at right angles to the fire service access elevator lobby. The fire service access elevator symbol shall be designed as shown in Figure 3007.7.5 and shall comply with the following:

1. The fire service access elevator symbol shall be not less than 3 inches (76 mm) in height.
2. The helmet shall contrast with the background, with either a light helmet on a dark background or a dark helmet on a light background.
~~2~~3. The vertical center line of the fire service access elevator symbol shall be centered on the hoistway door frame. Each symbol shall not be less than 78 inches (1981 mm), and not more than 84 (2134 mm) inches above the finished floor at the threshold.

(Add dimensional lines on Figure 3007.7.5 to indicate that it is the rectangular field, not the helmet that has a dimension of 3 inches (76 mm) minimum height.)

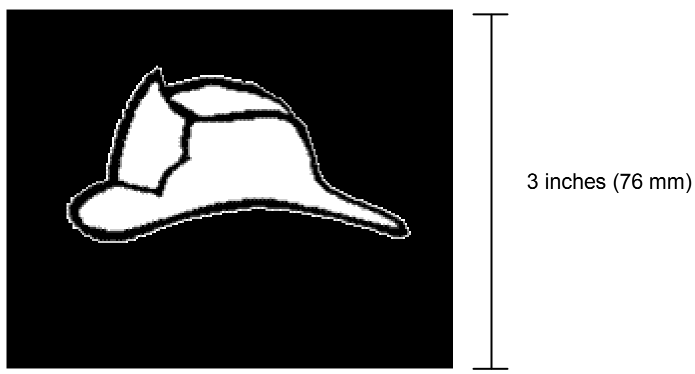


FIGURE 3007.7.5
FIRE SERVICE ACCESS ELEVATOR SYMBOL

Reason: Because the code is printed in black and white, the current text may be read to state that the symbol must always have a white helmet on a black background. This is unnecessarily restrictive, and in fact a red helmet may be the preferred color to harmonize with the buttons on the elevator car operating panel that are regulated by ASME A17.1/CSA B44.

The proposed new text in item 2 was adapted from the sign requirements of ICC/ANSI A117.1-2009.

Adding dimensional lines on the figure clears up the ambiguity regarding what height is being regulated.

Cost Impact: This code change proposal will not increase the cost of construction.

G178-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.7.5-G-BLACK

G179 – 12
3007.9

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3007.9 Electrical power. The following features serving each fire service access elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator hoistway lighting.
3. ~~Elevator machine room~~ Ventilation and cooling equipment for elevator machine/control rooms, and machinery/control spaces.
4. Elevator ~~controller cooling equipment~~ car lighting.

Reason: Editorial changes in item 3 reflect current terminology in ASME A17.1/CSA B44. Standby power is necessary for elevator car lighting as specified in item 4 to ensure that firefighters are not trapped in a pitch-black elevator in case the building power is interrupted.

Cost Impact: The code change will not increase the cost of construction.

G179-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3007.9-G-BLACK

G180 – 12
3008.2, 3008.2.1

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

~~**3008.2 Phase I Emergency recall operation**. An independent, three-position, key-operated "Fire Recall" switch complying with ASME A17.1/CSA B44 shall be provided at the designated level for each occupant evacuation elevator.~~

~~**3008.2.1**~~ **<u>3008.2</u> Operation.** The occupant evacuation elevators shall be used for occupant self-evacuation ~~only in the normal elevator operating mode prior to Phase I Emergency Recall Operation~~ in accordance with the <u>occupant evacuation operation</u> requirements in ASME A17.1/CSA B44 and the building's fire safety and evacuation plan.

(Renumber subsequent sections)

Reason: Requirements for *Occupant Evacuation Operation* have been approved for publication in the 2013 edition of ASME A17.1/CSA B44 *Safety Code for Elevators and Escalators*. With this development and corresponding changes to the NFPA 72 *Fire Alarm and Signaling Code*, the comprehensive ICC/ASME/NFPA package to establish occupant evacuation elevator requirements is complete, and provisions that were temporarily "parked" in the IBC can be removed as they are addressed by ASME A17.1/CSA B44.

ASME A17.1-2013CSA B44-13 will amend that code's Firefighters' Emergency Operations requirements to require a "GROUP FIRE RECALL" three-position switch in the designated level lobby with a corresponding two-position switch in the fire command center that can recall all of the elevators in that group. In addition, each elevator in that group will have a three-position key operated switch for CAR FIRE RECALL in the designated level elevator lobby. This configuration will allow firefighters to recall all of the elevators in a group if warranted, but only recall a few of the elevators for firefighter service as needed, allowing the remaining elevators to operate as occupant evacuation elevators. This was the purpose of the key operated switches required by Section 3008.2, thus making the IBC requirement unnecessary.

DRAFT FOR ASME A17.1-2013/CSA B44-13i

2.27.10 Occupant Evacuation Operation

Where elevators are provided for occupant evacuation, Occupant Evacuation Operation (OEO) shall be provided to function prior to Firefighters' Emergency Operation and shall conform to 2.27.10.1 through 2.27.10.6. See also Nonmandatory Appendix T.

2.27.10.1 The requirements of 2.27.3.1 shall be modified as follows:

2.27.10.1.1 The three-position switch in the lobby (2.27.3.1.1) and two-position switch in the fire command center (2.27.3.1.2) shall be labeled "GROUP FIRE RECALL" and indicate the elevator group that they control.

2.27.10.1.2 An additional three-position key-operated individual "CAR FIRE RECALL" switch per elevator, that will not change position without a deliberate action by the user, shall be located in the lobby at the elevator discharge level adjacent to the elevator it controls. Each switch shall be labeled "CAR ___ FIRE RECALL" (with the car identification, as specified in 2.29.1, inserted), and its positions marked "RESET", "OFF" and "ON" (in that order) in letters a minimum of 5 mm (0.25 in.) high. Text shall be black on a yellow background. Each switch shall control the associated elevator in conformance with 2.27.3.1.6, but shall not control the other elevators controlled by the "GROUP FIRE RECALL" switch (see 2.27.10.1.1).

2.27.10.1.3 Each individual "CAR FIRE RECALL" switch shall terminate Occupant Evacuation Operation for the elevator it controls when placed in the "ON" position. Each "GROUP FIRE RECALL" switch shall terminate Occupant Evacuation Operation for the elevators it controls when placed in the "ON" position.

2.27.10.1.4 Each individual "CAR FIRE RECALL" switch shall be provided with an illuminated visual signal to indicate when Phase I Emergency Recall Operation is in effect for that car (see 2.27.3.1.5).

2.27.10.1.5 To remove an individual elevator from Phase I Emergency Recall Operation, the individual "CAR FIRE RECALL" switch shall be rotated first to the "RESET," and then to the "OFF" position, provided that

(1) the "GROUP FIRE RECALL SWITCH" and the additional two-position "GROUP FIRE RECALL" switch, where provided, are in the "OFF" position

(2) no fire alarm initiating device is activated (see 2.27.3.2).

2.27.10.1.6 A car with its individual “CAR FIRE RECALL” switch in the “ON” position shall not be removed from Phase I Emergency Recall Operation when the “GROUP FIRE RECALL” switch is rotated to the “RESET” position and then to the “OFF” position.

2.27.10.1.7 The Designated Level shall be the same floor as the Elevator Discharge Level. At the elevator discharge level, only the door(s) serving the lobby where the “GROUP FIRE RECALL” switch is located shall open.

2.27.10.2 The sign required by 2.27.9 shall not be installed. A variable message sign, as defined in A117.1, shall be installed for each elevator group on each landing served. It shall be located not less than 2130 mm (84 in) and not more than 3000 mm (120 in) above the floor and in a central visible location within the elevator lobby. Message text shall be a minimum of 50 mm (2 in) high and conform to A117.1 or Appendix E requirement E-20, whichever is applicable (see Section 9 and E-1). The variable message signs shall be powered by the same power supply as the elevator, including emergency or standby power. Where not prohibited by the Building Code, when the elevators are not on Occupant Evacuation Operation or Firefighters’ Emergency Operation, the variable message signs shall be permitted to display other elevator system status messages. Note: sample text: “Elevators in normal operation”.

2.27.10.3 Where hoistway pressurization is provided, a car on Phase I Emergency Recall, after completing the requirements of 2.27.3.1.6, shall conform to the following:

a) A car shall close its doors after 15 seconds.

b) Door reopening devices, door force limiting devices, kinetic energy limiting devices, and the door open button shall remain active.

c) At least one operating device normally used to call a car to the landing (*e.g*. hall call button, keypad) shall be located in the elevator lobby at the elevator discharge level. Actuating this device shall cause all recalled cars to open their doors for 30 to 45 seconds, then reclose.

2.27.10.4 A position indicator shall be provided at the elevator discharge level above or adjacent to the entrance for each car. The position indicator shall be powered by the same power supply as the elevator, including emergency or standby power.

2.27.10.5 Fire Alarm System Interface

2.27.10.5.1 Upon activation of an automatic fire alarm initiating device in the building in any area which does not initiate Phase I recall in this group, the fire alarm system shall provide signals to the elevator system in conformance with NFPA 72 indicating the floors to be evacuated. The floors to be evacuated shall be a contiguous block of floors, consisting of at least the floor with an active alarm, two floors above and two floors below. The elevator system shall initiate Occupant Evacuation Operation in accordance with 2.27.10.6 for the indicated floors. If activation of an automatic fire alarm initiating device which does not initiate Phase I recall in this group occurs on an additional floor(s) at any time while Occupant Evacuation Operation in accordance with 2.27.10.6 is in effect, the evacuation zone shall be expanded to include all floors with an active alarm, all floors between the highest and lowest floor with an active alarm plus two floors above the highest floor with an active alarm and two floors below the lowest floor with an active alarm. If the active alarm is on the elevator discharge level, automatic initiation of Occupant Evacuation Operation in accordance with 2.27.10.6 shall not be permitted. Manual initiation by authorized or emergency personnel shall be permitted.

Note (2.27.10.5.1): An active alarm refers to the condition caused by the “activation of an automatic fire alarm initiating device” as used in this requirement.

2.27.10.5.2 A means to initiate total building evacuation, labeled “ELEVATOR TOTAL BUILDING EVACUATION” shall be provided at the fire command center location and installed in accordance with NFPA 72. When this means is actuated, the fire alarm system shall provide a signal to the elevator system indicating that all floors are to be evacuated.

2.27.10.6 When any of the signals provided in 2.27.10.5 actuate, the elevators shall conform to 2.27.10.6.1 through 2.27.10.6.10 in order to move occupants from the floors affected by the fire to the elevator discharge level.

2.27.10.6.1 The variable message signs required by 2.27.10.2 shall indicate one of the following messages:

(a) On all floors being evacuated, they shall indicate that the elevators are available for evacuation and the estimated time duration in minutes for the next elevator to arrive.
Note: Sample text: “Elevators and stairs available for evacuation. Next car in about 2 minutes”.

(b) On all floors not being evacuated, they shall indicate that elevator service is not available.
Note: Sample text: “Elevators temporarily dedicated to other floors”.

(c) On the elevator discharge level, they shall indicate that the cars are in evacuation mode and that passengers should not use elevators.
Note (2.27.10.6.1): Sample text: “Elevators dedicated to evacuation. Do not enter elevator”.

(d) If no elevators are available for Occupant Evacuation Operation (Fire service, inspection, shut off, etc.), they shall indicate that elevator service is not available. On all floors being evacuated they shall also indicate that occupants should use the stairs.

Note: Sample text for floors being evacuated: “Elevators out of service. Use stairs to evacuate”. Sample text for other floors: “Elevators out of service”.

2.27.10.6.2 Automatic visual signal or variable message sign, and voice notification in each car shall indicate that the car is being used to evacuate the building. In the event that the car stops to pick up passengers at a floor other than the elevator discharge level, the signals shall instruct the passengers to remain in the car. Upon or prior to arrival at the elevator discharge level, passengers shall be notified that they have arrived at the exit floor and to exit quickly. Message text shall be a minimum of 25 mm (1 in) high and conform to A117.1 or Appendix E requirement E-20, whichever is applicable (see Section 9 and E-1). Voice notification shall be at least 10 dBA above ambient but not more than 80 dBA measured 1525 mm (60 in) above the floor, at the center of the car.

2.27.10.6.3 All landing calls outside of the contiguous block of floors being evacuated shall be canceled and disabled. Building security systems which limit service to these floors shall be overridden. Any landing call within the contiguous block of floors shall call an elevator(s) to that landing. Landing calls entered at the floor with an active alarm shall be given higher priority than the calls at the floors above and below it. If a subsequent active alarm is received from a different floor, the evacuation priority shall be assigned in the sequence received. Once passengers have entered an elevator, it shall proceed only towards the elevator discharge level. When total building evacuation is in effect and no calls are entered at an affected floor, priority shall be based on distance from the elevator discharge level, with the furthest floor served getting highest priority.

2.27.10.6.4 Car calls for all floors, except for the elevator discharge level, shall be canceled and disabled. A car call for the elevator discharge level shall be automatically entered when any landing call is answered.

2.27.10.6.5 Cars which are unoccupied when Occupant Evacuation Operation is actuated shall move without delay to a floor which is being evacuated, and park with their doors closed until a landing call is registered. If the car is in motion away from the floors being evacuated, it shall stop at or before the next available floor, without opening the doors, reverse direction and move to a floor which is being evacuated.

2.27.10.6.6 Cars which are occupied when Occupant Evacuation Operation is actuated shall proceed without delay to the elevator discharge level. If a reversal of travel direction is needed, it shall be done at or before the next available floor without opening the doors. After opening and closing the doors at the elevator discharge level, they shall proceed without delay to a floor which is being evacuated and park with their doors closed until a landing call is registered.

2.27.10.6.7 When a car answers a landing call at a floor being evacuated, a car call for the elevator discharge level shall be automatically registered. The system shall accept a new landing call as soon as the doors have opened to permit loading at that floor, or sooner. If a new landing call is registered at this floor, it shall be assigned to another car, and not canceled until that car arrives. Actuation of the landing call device shall not prevent a loaded car from closing its doors and leaving the floor.

2.27.10.6.8 While passengers are entering the car at a floor being evacuated, when the load reaches no greater than 80% of car capacity, the door re-opening device(s) shall be disabled and the doors shall initiate closing at reduced kinetic energy in accordance with 2.13.4.2.1(c). If the doors stall while closing, they shall re-open fully, then close. An audible signal shall sound until the doors are closed. If the load exceeds 100% of capacity the doors shall re-open and remain open and a voice notification and visual signal shall indicate that the car is overloaded.

2.27.10.6.9 Once the block of floors being evacuated has been evacuated, as indicated by a 60 second period in which no landing calls are registered, one car shall park with its doors closed at the lowest floor of the block of floors ready to answer subsequent landing calls within the block of floors; the rest shall park with doors closed at the elevator discharge level. A car parked at the elevator discharge level shall replace the car at the lowest floor of the block, which has answered a landing call.

2.27.10.6.10 Occupant Evacuation Operation shall be terminated when the fire alarm system is reset or the signals provided in 2.27.3.2 are actuated (see 2.27.10.1.3).

i Approved 2011 by the ASME A17 Standards Committee for ASME A17.1-2013/CSA B44-13; subject to ANSI and ASME Board Approval. Provided for informational purposes and does not indicate endorsement by ASME or its Committees of proposed changes to the ICC *International Building Code*.

Cost Impact: This code change proposal will not increase the cost of construction.

G180-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3008.2-G-BLACK.doc

G181 – 12
3008.2.2

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Delete without substitution as follows:

~~**3008.2.2 Activation.** Occupant evacuation elevator systems shall be activated by any of the following:~~

1. ~~The operation of an *automatic sprinkler system* complying with Section 3008.3;~~
2. ~~*Smoke detectors* required by another provision of the code;~~
3. ~~*Approved* manual controls.~~

Reason: Requirements for *Occupant Evacuation Operation* have been approved for publication in the 2013 edition of ASME A17.1/CSA B44 *Safety Code for Elevators and Escalators*. With this development and corresponding changes to the NFPA 72 *Fire Alarm and Signaling Code*, the comprehensive ICC/ASME/NFPA package to establish occupant evacuation elevator requirements is complete, and provisions that were temporarily "parked" in the IBC can be removed as they are addressed by ASME A17.1/CSA B44.

ASME A17.1-2013/CSA B44-13 will include a section on Fire Alarm System Interface that requires that the activation of any building fire alarm initiating device not associated with Phase I elevator recall will provide signals to the elevator system controller(s) to indicate which building floors will be evacuated under the ASME Occupant Evacuation Operation criteria. These floors will be a contiguous block of floors consisting of the floor with the active alarm, two floors above, and two floors below. It will also accommodate enlarging the evacuation zone should other floors have an initiated fire alarm initiating device and will allow for full building evacuation when initiated by firefighters.

The ASME A17.1/CSA B44 requirements are more comprehensive than those in Section 3008.2.2 and the IBC requirements should be deleted in deference to the ASME provisions.

DRAFT FOR ASME A17.1-2013/CSA B44-13i

2.27.10 Occupant Evacuation Operation

Where elevators are provided for occupant evacuation, Occupant Evacuation Operation (OEO) shall be provided to function prior to Firefighters' Emergency Operation and shall conform to 2.27.10.1 through 2.27.10.6. See also Nonmandatory Appendix T.

2.27.10.1 The requirements of 2.27.3.1 shall be modified as follows:

2.27.10.1.1 The three-position switch in the lobby (2.27.3.1.1) and two-position switch in the fire command center (2.27.3.1.2) shall be labeled "GROUP FIRE RECALL" and indicate the elevator group that they control.

2.27.10.1.2 An additional three-position key-operated individual "CAR FIRE RECALL" switch per elevator, that will not change position without a deliberate action by the user, shall be located in the lobby at the elevator discharge level adjacent to the elevator it controls. Each switch shall be labeled "CAR ___ FIRE RECALL" (with the car identification, as specified in 2.29.1, inserted), and its positions marked "RESET", "OFF" and "ON" (in that order) in letters a minimum of 5 mm (0.25 in.) high. Text shall be black on a yellow background. Each switch shall control the associated elevator in conformance with 2.27.3.1.6, but shall not control the other elevators controlled by the "GROUP FIRE RECALL" switch (see 2.27.10.1.1).

2.27.10.1.3 Each individual "CAR FIRE RECALL" switch shall terminate Occupant Evacuation Operation for the elevator it controls when placed in the "ON" position. Each "GROUP FIRE RECALL" switch shall terminate Occupant Evacuation Operation for the elevators it controls when placed in the "ON" position.

2.27.10.1.4 Each individual "CAR FIRE RECALL" switch shall be provided with an illuminated visual signal to indicate when Phase I Emergency Recall Operation is in effect for that car (see 2.27.3.1.5).

2.27.10.1.5 To remove an individual elevator from Phase I Emergency Recall Operation, the individual "CAR FIRE RECALL" switch shall be rotated first to the "RESET," and then to the "OFF" position, provided that

(*1*) the "GROUP FIRE RECALL SWITCH" and the additional two-position "GROUP FIRE RECALL" switch, where provided, are in the "OFF" position

(2) no fire alarm initiating device is activated (see 2.27.3.2).

2.27.10.1.6 A car with its individual "CAR FIRE RECALL" switch in the "ON" position shall not be removed from Phase I Emergency Recall Operation when the "GROUP FIRE RECALL" switch is rotated to the "RESET" position and then to the "OFF" position.

2.27.10.1.7 The Designated Level shall be the same floor as the Elevator Discharge Level. At the elevator discharge level, only the door(s) serving the lobby where the "GROUP FIRE RECALL" switch is located shall open.

2.27.10.2 The sign required by 2.27.9 shall not be installed. A variable message sign, as defined in A117.1, shall be installed for each elevator group on each landing served. It shall be located not less than 2130 mm (84 in) and not more than 3000 mm (120 in) above the floor and in a central visible location within the elevator lobby. Message text shall be a minimum of 50 mm (2 in) high and conform to A117.1 or Appendix E requirement E-20, whichever is applicable (see Section 9 and E-1). The variable message signs shall be powered by the same power supply as the elevator, including emergency or standby power. Where not prohibited by the Building Code, when the elevators are not on Occupant Evacuation Operation or Firefighters' Emergency Operation, the variable message signs shall be permitted to display other elevator system status messages. Note: sample text: "Elevators in normal operation".

2.27.10.3 Where hoistway pressurization is provided, a car on Phase I Emergency Recall, after completing the requirements of 2.27.3.1.6, shall conform to the following:

a) A car shall close its doors after 15 seconds.

b) Door reopening devices, door force limiting devices, kinetic energy limiting devices, and the door open button shall remain active.

c) At least one operating device normally used to call a car to the landing (*e.g.* hall call button, keypad) shall be located in the elevator lobby at the elevator discharge level. Actuating this device shall cause all recalled cars to open their doors for 30 to 45 seconds, then reclose.

2.27.10.4 A position indicator shall be provided at the elevator discharge level above or adjacent to the entrance for each car. The position indicator shall be powered by the same power supply as the elevator, including emergency or standby power.

2.27.10.5 Fire Alarm System Interface

2.27.10.5.1 Upon activation of an automatic fire alarm initiating device in the building in any area which does not initiate Phase I recall in this group, the fire alarm system shall provide signals to the elevator system in conformance with NFPA 72 indicating the floors to be evacuated. The floors to be evacuated shall be a contiguous block of floors, consisting of at least the floor with an active alarm, two floors above and two floors below. The elevator system shall initiate Occupant Evacuation Operation in accordance with 2.27.10.6 for the indicated floors. If activation of an automatic fire alarm initiating device which does not initiate Phase I recall in this group occurs on an additional floor(s) at any time while Occupant Evacuation Operation in accordance with 2.27.10.6 is in effect, the evacuation zone shall be expanded to include all floors with an active alarm, all floors between the highest and lowest floor with an active alarm plus two floors above the highest floor with an active alarm and two floors below the lowest floor with an active alarm. If the active alarm is on the elevator discharge level, automatic initiation of Occupant Evacuation Operation in accordance with 2.27.10.6 shall not be permitted. Manual initiation by authorized or emergency personnel shall be permitted.

Note (2.27.10.5.1): An active alarm refers to the condition caused by the "activation of an automatic fire alarm initiating device" as used in this requirement.

2.27.10.5.2 A means to initiate total building evacuation, labeled "ELEVATOR TOTAL BUILDING EVACUATION" shall be provided at the fire command center location and installed in accordance with NFPA 72. When this means is actuated, the fire alarm system shall provide a signal to the elevator system indicating that all floors are to be evacuated.

2.27.10.6 When any of the signals provided in 2.27.10.5 actuate, the elevators shall conform to 2.27.10.6.1 through 2.27.10.6.10 in order to move occupants from the floors affected by the fire to the elevator discharge level.

2.27.10.6.1 The variable message signs required by 2.27.10.2 shall indicate one of the following messages:

(a) On all floors being evacuated, they shall indicate that the elevators are available for evacuation and the estimated time duration in minutes for the next elevator to arrive.
Note: Sample text: "Elevators and stairs available for evacuation. Next car in about 2 minutes".

(b) On all floors not being evacuated, they shall indicate that elevator service is not available.
Note: Sample text: "Elevators temporarily dedicated to other floors".

(c) On the elevator discharge level, they shall indicate that the cars are in evacuation mode and that passengers should not use elevators.
Note (2.27.10.6.1): Sample text: "Elevators dedicated to evacuation. Do not enter elevator".

(d) If no elevators are available for Occupant Evacuation Operation (Fire service, inspection, shut off, etc.), they shall indicate that elevator service is not available. On all floors being evacuated they shall also indicate that occupants should use the stairs.

Note: Sample text for floors being evacuated: "Elevators out of service. Use stairs to evacuate". Sample text for other floors: "Elevators out of service".

2.27.10.6.2 Automatic visual signal or variable message sign, and voice notification in each car shall indicate that the car is being used to evacuate the building. In the event that the car stops to pick up passengers at a floor other than the elevator discharge level, the signals shall instruct the passengers to remain in the car. Upon or prior to arrival at the elevator discharge level, passengers shall be notified that they have arrived at the exit floor and to exit quickly. Message text shall be a minimum of 25 mm (1 in) high and conform to A117.1 or Appendix E requirement E-20, whichever is applicable (see Section 9 and E-1). Voice notification shall be at least 10 dBA above ambient but not more than 80 dBA measured 1525 mm (60 in) above the floor, at the center of the car.

2.27.10.6.3 All landing calls outside of the contiguous block of floors being evacuated shall be canceled and disabled. Building security systems which limit service to these floors shall be overridden. Any landing call within the contiguous block of floors shall call an elevator(s) to that landing. Landing calls entered at the floor with an active alarm shall be given higher priority than the calls at the floors above and below it. If a subsequent active alarm is received from a different floor, the evacuation priority shall be assigned in the sequence received. Once passengers have entered an elevator, it shall proceed only towards the elevator discharge level. When total building evacuation is in effect and no calls are entered at an affected floor, priority shall be based on distance from the elevator discharge level, with the furthest floor served getting highest priority.

2.27.10.6.4 Car calls for all floors, except for the elevator discharge level, shall be canceled and disabled. A car call for the elevator discharge level shall be automatically entered when any landing call is answered.

2.27.10.6.5 Cars which are unoccupied when Occupant Evacuation Operation is actuated shall move without delay to a floor which is being evacuated, and park with their doors closed until a landing call is registered. If the car is in motion away from the floors being evacuated, it shall stop at or before the next available floor, without opening the doors, reverse direction and move to a floor which is being evacuated.

2.27.10.6.6 Cars which are occupied when Occupant Evacuation Operation is actuated shall proceed without delay to the elevator discharge level. If a reversal of travel direction is needed, it shall be done at or before the next available floor without opening the doors. After opening and closing the doors at the elevator discharge level, they shall proceed without delay to a floor which is being evacuated and park with their doors closed until a landing call is registered.

2.27.10.6.7 When a car answers a landing call at a floor being evacuated, a car call for the elevator discharge level shall be automatically registered. The system shall accept a new landing call as soon as the doors have opened to permit loading at that floor, or sooner. If a new landing call is registered at this floor, it shall be assigned to another car, and not canceled until that car arrives. Actuation of the landing call device shall not prevent a loaded car from closing its doors and leaving the floor.

2.27.10.6.8 While passengers are entering the car at a floor being evacuated, when the load reaches no greater than 80% of car capacity, the door re-opening device(s) shall be disabled and the doors shall initiate closing at reduced kinetic energy in accordance with 2.13.4.2.1(c). If the doors stall while closing, they shall re-open fully, then close. An audible signal shall sound until the doors are closed. If the load exceeds 100% of capacity the doors shall re-open and remain open and a voice notification and visual signal shall indicate that the car is overloaded.

2.27.10.6.9 Once the block of floors being evacuated has been evacuated, as indicated by a 60 second period in which no landing calls are registered, one car shall park with its doors closed at the lowest floor of the block of floors ready to answer subsequent landing calls within the block of floors; the rest shall park with doors closed at the elevator discharge level. A car parked at the elevator discharge level shall replace the car at the lowest floor of the block, which has answered a landing call.

2.27.10.6.10 Occupant Evacuation Operation shall be terminated when the fire alarm system is reset or the signals provided in 2.27.3.2 are actuated (see 2.27.10.1.3).

i Approved 2011 by the ASME A17 Standards Committee for ASME A17.1-2013/CSA B44-13; subject to ANSI and ASME Board Approval. Provided for informational purposes and does not indicate endorsement by ASME or its Committees of proposed changes to the ICC *International Building Code*.

Cost Impact: This code change proposal will not increase the cost of construction.

G181-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3008.2.2-G-BLACK

G182 – 12
3008.7.3

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3008.7.3 Lobby doorways. Other than ~~the~~ doors to the hoistway, elevator control room, or elevator control space, each doorway to an occupant evacuation elevator lobby shall be provided with a 3/4-hour *fire door assembly* complying with Section 716.5. The *fire door assembly* shall also comply with the smoke and draft control assembly requirements of Section 716.5.3.1 with the UL 1784 test conducted without the artificial bottom seal.

Reason: Machine Room Less (MRL) elevators permitted by ASME A17.1/CSA B44 typically have control rooms or control spaces that are accessed by a door immediately adjacent to a hoistway opening in an elevator lobby.

3008.7.3 is intended to maintain the integrity of the lobby enclosure smoke barrier and the lobby's separation from the remaining floor area on a building floor (see 3008.7.2). This ensures that smoke from another area on the floor will not reach the lobby smoke detectors and place the elevator(s) into Phase I, thus rendering them unusable for Occupant Evacuation.

Smoke and draft control is unnecessary on elevator control room or space doors because any smoke emanating from those spaces has already activated the smoke detector in the control room/space and placed the elevator(s) in Phase I operation. It is thus unnecessary to protect the lobby smoke detector from smoke originating in the control room/space (or the hoistway to which the room/space is connected).

The ASME A17 Firefighters and Occupant Egress Task Groups that performed the hazard analyses that resulted in Occupant Evacuation Elevators did not discuss MRL elevators in their initial analyses that led to the current IBC requirements, and thus did not anticipate the problem of control room and control space doors opening into a lobby enclosure.

Cost Impact: This code change proposal will not increase the cost of construction.

G182-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3008.7.3-G-BLACK.doc

G183 – 12
3008.7.6

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Delete without substitution as follows:

~~**3008.7.6 Lobby status indicator.** Each occupant evacuation elevator lobby shall be equipped with a status indicator arranged to display all of the following information:~~

1. ~~An illuminated green light and the message, "Elevators available for occupant evacuation" when the elevators are operating in normal service and the *fire alarm system* is indicating an alarm in the building.~~
2. ~~An illuminated red light and the message, "Elevators out of service, use *exit stairs*" when the elevators are in Phase I emergency recall operation in accordance with the requirements in ASME A17.1/CSA B44.~~
3. ~~No illuminated light or message when the elevators are operating in normal service.~~

Reason: Requirements for *Occupant Evacuation Operation* have been approved for publication in the 2013 edition of ASME A17.1/CSA B44 *Safety Code for Elevators and Escalators*. With this development and corresponding changes to the NFPA 72 *Fire Alarm and Signaling Code*, the comprehensive ICC/ASME/NFPA package to establish occupant evacuation elevator requirements is complete, and provisions that were temporarily "parked" in the IBC can be removed as they are addressed by ASME A17.1/CSA B44.

ASME A17.1-2013/CSA B44-13 will include all of the information specified in Section 3008.7.6, (1) and (2). In addition, it will require approximate waiting times for persons awaiting an evacuation elevator and an indication that exit stairs may also be used.

ASME A17.1-2013/CSA B44-13 will also provide indicators in the signs in lobbies on floors not being evacuated that elevator service is not available. This will ensure that persons who have heard of a fire in the building and who are aware that elevators may be available for evacuation will not waste time waiting for elevators that will not arrive at their floors.

ASME A17.1-2013/CSA B44-13 will require every sign in elevator lobbies where elevators have entered Phase I Firefighter service to indicate that the elevators are out of service and not available.

ASME A17.1-2013/CSA B44-13 differs from the IBC in that it will permit messages such as "Elevators in normal operation" on the lobby status indicator signs when no evacuation is occurring. The ASME A17 Elevators & Fire Task Group believes that this will accustom building occupants to reading the indicators and will also allow for monitoring to ensure that the signs are operable when needed.

Finally, ASME A17.1-2013/CSA B44-13 will specify that all indicator signs comply with the Variable Message Sign requirements of ICC/ANSI A117.1, thus ensuring they are accessible to persons with disabilities.

For these reasons, Section 3008.7.6 should be deleted in deference to the referenced standard.

DRAFT FOR ASME A17.1-2013/CSA B44-13i

2.27.10 Occupant Evacuation Operation

Where elevators are provided for occupant evacuation, Occupant Evacuation Operation (OEO) shall be provided to function prior to Firefighters' Emergency Operation and shall conform to 2.27.10.1 through 2.27.10.6. See also Nonmandatory Appendix T.

2.27.10.1 The requirements of 2.27.3.1 shall be modified as follows:

2.27.10.1.1 The three-position switch in the lobby (2.27.3.1.1) and two-position switch in the fire command center (2.27.3.1.2) shall be labeled "GROUP FIRE RECALL" and indicate the elevator group that they control.

2.27.10.1.2 An additional three-position key-operated individual "CAR FIRE RECALL" switch per elevator, that will not change position without a deliberate action by the user, shall be located in the lobby at the elevator discharge level adjacent to the elevator it controls. Each switch shall be labeled "CAR ___ FIRE RECALL" (with the car identification, as specified in 2.29.1, inserted), and its positions marked "RESET", "OFF" and "ON" (in that order) in letters a minimum of 5 mm (0.25 in.) high. Text shall be black on a yellow background. Each switch shall control the associated elevator in conformance with 2.27.3.1.6, but shall not control the other elevators controlled by the "GROUP FIRE RECALL" switch (see 2.27.10.1.1).

2.27.10.1.3 Each individual "CAR FIRE RECALL" switch shall terminate Occupant Evacuation Operation for the elevator it controls when placed in the "ON" position. Each "GROUP FIRE RECALL" switch shall terminate Occupant Evacuation Operation for the elevators it controls when placed in the "ON" position.

2.27.10.1.4 Each individual "CAR FIRE RECALL" switch shall be provided with an illuminated visual signal to indicate when Phase I Emergency Recall Operation is in effect for that car (see 2.27.3.1.5).

2.27.10.1.5 To remove an individual elevator from Phase I Emergency Recall Operation, the individual “CAR FIRE RECALL” switch shall be rotated first to the “RESET,” and then to the “OFF” position, provided that

(1) the “GROUP FIRE RECALL SWITCH” and the additional two-position “GROUP FIRE RECALL” switch, where provided, are in the “OFF” position

(2) no fire alarm initiating device is activated (see 2.27.3.2).

2.27.10.1.6 A car with its individual “CAR FIRE RECALL” switch in the “ON” position shall not be removed from Phase I Emergency Recall Operation when the “GROUP FIRE RECALL” switch is rotated to the “RESET” position and then to the “OFF” position.

2.27.10.1.7 The Designated Level shall be the same floor as the Elevator Discharge Level. At the elevator discharge level, only the door(s) serving the lobby where the “GROUP FIRE RECALL” switch is located shall open.

2.27.10.2 The sign required by 2.27.9 shall not be installed. A variable message sign, as defined in A117.1, shall be installed for each elevator group on each landing served. It shall be located not less than 2130 mm (84 in) and not more than 3000 mm (120 in) above the floor and in a central visible location within the elevator lobby. Message text shall be a minimum of 50 mm (2 in) high and conform to A117.1 or Appendix E requirement E-20, whichever is applicable (see Section 9 and E-1). The variable message signs shall be powered by the same power supply as the elevator, including emergency or standby power. Where not prohibited by the Building Code, when the elevators are not on Occupant Evacuation Operation or Firefighters’ Emergency Operation, the variable message signs shall be permitted to display other elevator system status messages. Note: sample text: “Elevators in normal operation”.

2.27.10.3 Where hoistway pressurization is provided, a car on Phase I Emergency Recall, after completing the requirements of 2.27.3.1.6, shall conform to the following:

a) A car shall close its doors after 15 seconds.

b) Door reopening devices, door force limiting devices, kinetic energy limiting devices, and the door open button shall remain active.

c) At least one operating device normally used to call a car to the landing (*e.g*. hall call button, keypad) shall be located in the elevator lobby at the elevator discharge level. Actuating this device shall cause all recalled cars to open their doors for 30 to 45 seconds, then reclose.

2.27.10.4 A position indicator shall be provided at the elevator discharge level above or adjacent to the entrance for each car. The position indicator shall be powered by the same power supply as the elevator, including emergency or standby power.

2.27.10.5 Fire Alarm System Interface

2.27.10.5.1 Upon activation of an automatic fire alarm initiating device in the building in any area which does not initiate Phase I recall in this group, the fire alarm system shall provide signals to the elevator system in conformance with NFPA 72 indicating the floors to be evacuated. The floors to be evacuated shall be a contiguous block of floors, consisting of at least the floor with an active alarm, two floors above and two floors below. The elevator system shall initiate Occupant Evacuation Operation in accordance with 2.27.10.6 for the indicated floors. If activation of an automatic fire alarm initiating device which does not initiate Phase I recall in this group occurs on an additional floor(s) at any time while Occupant Evacuation Operation in accordance with 2.27.10.6 is in effect, the evacuation zone shall be expanded to include all floors with an active alarm, all floors between the highest and lowest floor with an active alarm plus two floors above the highest floor with an active alarm and two floors below the lowest floor with an active alarm. If the active alarm is on the elevator discharge level, automatic initiation of Occupant Evacuation Operation in accordance with 2.27.10.6 shall not be permitted. Manual initiation by authorized or emergency personnel shall be permitted.

Note (2.27.10.5.1): An active alarm refers to the condition caused by the “activation of an automatic fire alarm initiating device” as used in this requirement.

2.27.10.5.2 A means to initiate total building evacuation, labeled “ELEVATOR TOTAL BUILDING EVACUATION” shall be provided at the fire command center location and installed in accordance with NFPA 72. When this means is actuated, the fire alarm system shall provide a signal to the elevator system indicating that all floors are to be evacuated.

2.27.10.6 When any of the signals provided in 2.27.10.5 actuate, the elevators shall conform to 2.27.10.6.1 through 2.27.10.6.10 in order to move occupants from the floors affected by the fire to the elevator discharge level.

2.27.10.6.1 The variable message signs required by 2.27.10.2 shall indicate one of the following messages:

(a) On all floors being evacuated, they shall indicate that the elevators are available for evacuation and the estimated time duration in minutes for the next elevator to arrive.
Note: Sample text: “Elevators and stairs available for evacuation. Next car in about 2 minutes”.

(b) On all floors not being evacuated, they shall indicate that elevator service is not available.
Note: Sample text: “Elevators temporarily dedicated to other floors”.

(c) On the elevator discharge level, they shall indicate that the cars are in evacuation mode and that passengers should not use elevators.
Note (2.27.10.6.1): Sample text: “Elevators dedicated to evacuation. Do not enter elevator”.

(d) If no elevators are available for Occupant Evacuation Operation (Fire service, inspection, shut off, etc.), they shall indicate that elevator service is not available. On all floors being evacuated they shall also indicate that occupants should use the stairs.

Note: Sample text for floors being evacuated: “Elevators out of service. Use stairs to evacuate”. Sample text for other floors: “Elevators out of service”.

2.27.10.6.2 Automatic visual signal or variable message sign, and voice notification in each car shall indicate that the car is being used to evacuate the building. In the event that the car stops to pick up passengers at a floor other than the elevator discharge level, the signals shall instruct the passengers to remain in the car. Upon or prior to arrival at the elevator discharge level, passengers shall be notified that they have arrived at the exit floor and to exit quickly. Message text shall be a minimum of 25 mm (1 in) high and conform to A117.1 or Appendix E requirement E-20, whichever is applicable (see Section 9 and E-1). Voice notification shall be at least 10 dBA above ambient but not more than 80 dBA measured 1525 mm (60 in) above the floor, at the center of the car.

2.27.10.6.3 All landing calls outside of the contiguous block of floors being evacuated shall be canceled and disabled. Building security systems which limit service to these floors shall be overridden. Any landing call within the contiguous block of floors shall call an elevator(s) to that landing. Landing calls entered at the floor with an active alarm shall be given higher priority than the calls at the floors above and below it. If a subsequent active alarm is received from a different floor, the evacuation priority shall be assigned in the sequence received. Once passengers have entered an elevator, it shall proceed only towards the elevator discharge level. When total building evacuation is in effect and no calls are entered at an affected floor, priority shall be based on distance from the elevator discharge level, with the furthest floor served getting highest priority.

2.27.10.6.4 Car calls for all floors, except for the elevator discharge level, shall be canceled and disabled. A car call for the elevator discharge level shall be automatically entered when any landing call is answered.

2.27.10.6.5 Cars which are unoccupied when Occupant Evacuation Operation is actuated shall move without delay to a floor which is being evacuated, and park with their doors closed until a landing call is registered. If the car is in motion away from the floors being evacuated, it shall stop at or before the next available floor, without opening the doors, reverse direction and move to a floor which is being evacuated.

2.27.10.6.6 Cars which are occupied when Occupant Evacuation Operation is actuated shall proceed without delay to the elevator discharge level. If a reversal of travel direction is needed, it shall be done at or before the next available floor without opening the doors. After opening and closing the doors at the elevator discharge level, they shall proceed without delay to a floor which is being evacuated and park with their doors closed until a landing call is registered.

2.27.10.6.7 When a car answers a landing call at a floor being evacuated, a car call for the elevator discharge level shall be automatically registered. The system shall accept a new landing call as soon as the doors have opened to permit loading at that floor, or sooner. If a new landing call is registered at this floor, it shall be assigned to another car, and not canceled until that car arrives. Actuation of the landing call device shall not prevent a loaded car from closing its doors and leaving the floor.

2.27.10.6.8 While passengers are entering the car at a floor being evacuated, when the load reaches no greater than 80% of car capacity, the door re-opening device(s) shall be disabled and the doors shall initiate closing at reduced kinetic energy in accordance with 2.13.4.2.1(c). If the doors stall while closing, they shall re-open fully, then close. An audible signal shall sound until the doors are closed. If the load exceeds 100% of capacity the doors shall re-open and remain open and a voice notification and visual signal shall indicate that the car is overloaded.

2.27.10.6.9 Once the block of floors being evacuated has been evacuated, as indicated by a 60 second period in which no landing calls are registered, one car shall park with its doors closed at the lowest floor of the block of floors ready to answer subsequent landing calls within the block of floors; the rest shall park with doors closed at the elevator discharge level. A car parked at the elevator discharge level shall replace the car at the lowest floor of the block, which has answered a landing call.

2.27.10.6.10 Occupant Evacuation Operation shall be terminated when the fire alarm system is reset or the signals provided in 2.27.3.2 are actuated (see 2.27.10.1.3).

[i] Approved 2011 by the ASME A17 Standards Committee for ASME A17.1-2013/CSA B44-13; subject to ANSI and ASME Board Approval. Provided for informational purposes and does not indicate endorsement by ASME or its Committees of proposed changes to the ICC *International Building Code*.

Cost Impact: This code change proposal will not increase construction costs.

G183-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3008.7.6-G-BLACK.doc

G184 – 12
3008.7.7.1, 3008.7.7.2

Proponent: Jerome Seville, Commonwealth of Pennsylvania representing self

Revise as follows:

3008.7.7 Two-way communication system. A two-way communication system shall be provided in each occupant evacuation elevator lobby for the purpose of initiating communication with the *fire command center* or an alternate location *approved* by the fire department.

3008.7.7.1 Design and installation. The two-way communication system shall be provided and installed in accordance with Section 1007.8 ~~include audible and visible signals and shall be designed and installed in accordance with the requirements in ICC A117.1~~.

~~**3008.7.7.2 Instructions.** Instructions for the use of the two-way communication system along with the location of the station shall be permanently located adjacent to each station. Signage shall comply with the ICC A117.1 requirements for visual characters.~~

Reason: The revision will help make sure that the two way communication system requirements will remain consistent over time. The provisions currently in 1007.8 are more complete. The reference to ICC A117.1 will be picked up through the controls requirements in 1109.13 and the signage requirement currently in 1110.3.

Cost Impact: The proposed changes will not increase the cost of construction.

G184-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3008.7.7-G-Seville.doc

G185 – 12
3008.9

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

3008.9 Electrical power. The following features serving each occupant evacuation elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
3. ~~Elevator machine room v~~ *Ventilation* and cooling equipment for elevator machine/control rooms, and machinery/control spaces.
4. Elevator ~~controller cooling equipment~~ car lighting.

Reason: Editorial changes in item 2 reflect current terminology in ASME A17.1/CSA B44. Standby power is necessary for elevator car lighting as specified in item 3 to ensure that occupants are not trapped in a pitch-black elevator in case the building power is interrupted.

Cost Impact: This code change proposal will not increase the cost of construction.

G185-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3008.9-G-BLACK.doc

G186 – 12
202, 3102.1, Chapter 35

Proponent: Jennifer Goupil P.E., The Structural Engineering Institute of ASCE, representing herself (jgoupil@asce.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3102.1 General. The provisions of Sections 3102.1 through 3102.8 shall apply to air-supported, air-inflated, membrane covered cable<u>,</u> ~~and~~ membrane-covered frame structures, <u>and tensile membrane structures,</u> collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the *International Fire Code*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy are required to meet only the requirements of Sections 3102.3.1 and 3102.7. Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

Add new definition as follows:

<u>**TENSILE MEMBRANE STRUCTURE.** A membrane structure having a shape that is determined by tension in the membrane and the geometry of the support structure. Typically, the structure consists of both flexible elements (e.g. membrane and cables), non-flexible elements (e.g. struts, masts, beams and arches) and the anchorage (e.g. supports and foundations). This includes Frame-supported tensile membrane structures.</u>

Add new standard to Chapter 35 as follows:

ASCE/SEI
<u>ASCE/SEI 55—10 Tensile Membrane Structures</u>

Reason: This change proposes to add the new referenced standard *ASCE 55 Tensile Membrane Structures.* This Standard provides minimum criteria for the design and performance of tensile membrane cable and rigid member structures, including frame structures, collectively known as tensile membrane structures, including permanent and temporary structures as defined herein. The requirements of this Standard shall apply whether the tensile membrane structure is independent of or attached to another structure. This Standard does not apply to air-supported or air-inflated structures.

In addition to the scope and definitions, the Standard includes chapters on membrane materials, connections, design, fabrication and erection, as well as appendices for special provisions and a procedure for determining modulus of elasticity.

ASCE/SEI 55 is published and maintained by the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE). The document is a nationally recognized consensus standard developed in full compliance with the ASCE *Rules for Standards Committees*. The ASCE standards process is fully accredited by the American National Standards Institute (ANSI).

The document is designated ASCE/SEI 55-10 *Tensile Membrane Structures* and it is currently available for purchase from ASCE. Any person interested in obtaining a public comment copy of ASCE/SEI 55 may do so by contacting the proponent at jgoupil@asce.org. A copy of the standard has been submitted with this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASCE/SEI 55-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G186-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-TENSILE MEMBRANE STRUCTURE (NEW)-G-GOUPIL

G187 –12
3102.7.1 (NEW)

Proponent: John Gross (john.gross@nist.gov) and Fahim Sadek (fahim.sadek@nist.gov), National Institute of Standards and Technology (NIST), Department of Commerce (NIST)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3102.7.1 Membrane. For membrane-covered frame structures, the membrane shall not be considered to provide lateral restraint in the calculation of the capacities of the frame members.

Reason: This proposal is one of three submitted on the basis of the National Institute of Standards and Technology (NIST) study of the collapse of the Dallas Cowboys Indoor Practice Facility of May 2, 2009 (Gross et al., 2010).

In its study of the collapse of the Dallas Cowboys Indoor Practice Facility, a membrane-covered frame structure, NIST found that the facility was designed assuming that the tensioned exterior membrane provided lateral bracing for the frames. Had the building been designed assuming that the membrane would not provide lateral restraint, the design capacity for some frame members would have been 46 % of the capacity based on the assumption that the membrane provides full lateral restraint (see Table 5-5 of Gross et al., 2010)?

A review of the state of the practice indicated that there is some disparity among designers of membrane-covered frame structures regarding the contribution of the membrane to the stability of the frame members: some designers rely on the membrane to provide lateral support to the frames, while others do not. The amount of lateral restraint provided by the membrane depends on the stiffness and strength of the membrane which are not well quantified over the lifespan of the membrane. The degree of lateral restraint also depends on the level of tension in the membrane, which is uncertain since it is a function of the initial tensioning and maintenance procedure over the life of the membrane. A particular concern is the susceptibility of the fabric material to tearing due to a variety of reasons such as wind-borne debris during windstorms, accidental cuts during installation or maintenance, or degradation of the fabric tear strength due to environmental conditions including ultraviolet exposure. In such cases, tearing of the fabric would compromise the stability of the structural frames, which would in turn threaten the integrity of the entire structural system. In addition, tears in the fabric could introduce unbalanced lateral loads on the frame members. As a result, not considering the membrane to provide lateral restraint to the framing of the building is appropriate and justifiable on the basis of the factors mentioned herein.

Bibliography:
Gross, J.L., Main, J.A., Phan, L.T., Sadek, F., Cauffman, S.A., and Jorgensen, D.P., (2010), ~~Fina~~l Report on the Collapse of the Dallas Cowboys Indoor Practice Facility, May 2, 2009, NISTIR 7661, Gaithersburg, MD, January.

Cost Impact: The code change proposal will increase the cost of construction. This proposed change may require an increase in capacity for some structural members subjected to compression. This increase will result in moderate increase in the overall cost of construction. It is believed that such a cost impact is justified on the basis of occupant safety.

G187-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3102.7.1-G-GROSS-SADEK.doc

G188 – 12
3102.7.2 (NEW)

Proponent: John Gross (john.gross@nist.gov) and Fahim Sadek (fahim.sadek@nist.gov), National Institute of Standards and Technology (NIST), Department of Commerce (NIST)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new test as follows:

3102.7.2 Enclosure Classification. For membrane-covered frame structures, the building shall not be classified as "enclosed" as defined in ASCE 7 for determining the internal wind pressure coefficient for the calculation of wind loads on the main wind force resisting system.

Reason: This proposal is one of three submitted on the basis of the National Institute of Standards and Technology (NIST) study of the collapse of the Dallas Cowboys Indoor Practice Facility of May 2, 2009 (Gross et al., 2010).

In its study of the collapse of the Dallas Cowboys Indoor Practice Facility, a membrane-covered frame structure, NIST found that the facility was designed based on an "enclosed" classification for the purpose of calculating internal wind pressures, despite the presence of vent and door openings around the building perimeter that would result in a classification as partially enclosed (if the vents were even partially open). During the windstorm that led to the failure of the building, videographic records showed that at least one roll-up door failed to remain closed as a result of building distortion (see Figure 3-3 of Gross et al., 2010). Had the building been designed on the basis of a "partially enclosed" classification, the design demand for some frame members would have been 42 % higher than the demand based on the "enclosed" classification used in the design of the facility (see Table 5-4 of Gross et al., 2010).

In addition to the presence of vents and openings around the perimeter of the building, membrane-covered frame structures may be flexible, and large deformations of the building frames during wind events can render doors open, potentially resulting in a partially enclosed condition. Furthermore, a variety of circumstances, such as wind-borne debris, could cause the membrane to tear, which could result in higher internal pressures during windstorms than those obtained if the membrane covering remained intact. As a result, using the more conservative "partially enclosed" classification for calculating the internal wind pressures for these buildings is appropriate and justifiable on the basis of the factors mentioned above.

Bibliography:

Gross, J.L., Main, J.A., Phan, L.T., Sadek, F., Cauffman, S.A., and Jorgensen, D.P., (2010), Final Report on the Collapse of the Dallas Cowboys Indoor Practice Facility, May 2, 2009, NISTIR 7661, Gaithersburg, MD, January.

Cost Impact: The code change proposal will increase the cost of construction. This proposed change may require an increase in capacity for some structural members. This increase will result in moderate increase in the overall cost of construction. It is believed that such a cost impact is justified on the basis of occupant safety.

G188-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3102.7.2-G-GROSS-SADEK.doc

G189 – 12
3102.7.3 (NEW)

Proponent: John Gross (john.gross@nist.gov) and Fahim Sadek (fahim.sadek@nist.gov), National Institute of Standards and Technology (NIST), Department of Commerce (NIST)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

<u>**3102.7.3 Structural Integrity.** Membrane-covered frame structures shall be designed such that failure of a frame member does not result in the overall collapse of the structure. The membrane shall not be considered to provide lateral bracing necessary for overall structural integrity.</u>

Reason: This proposal is one of three submitted on the basis of the National Institute of Standards and Technology (NIST) study of the collapse of the Dallas Cowboys Indoor Practice Facility of May 2, 2009 (Gross et al., 2010).

In its study of the collapse of the Dallas Cowboys Indoor Practice Facility, a membrane-covered frame structure, NIST found that while the collapse of the facility initiated with overloading of one or more structural frames, these failures led to a total collapse of the practice facility. This suggests that the adequacy of the structural system, including the lateral bracing, to maintain overall structural integrity of membrane-covered frame structures should be evaluated. The membrane should not be relied upon to provide overall lateral bracing to the structure due to its susceptibility to tearing due to a variety of reasons such as wind-borne debris during windstorms, accidental cuts during installation or maintenance, or degradation of the fabric tear strength due to environmental conditions including ultraviolet exposure.

Bibliography:

Gross, J.L., Main, J.A., Phan, L.T., Sadek, F., Cauffman, S.A., and Jorgensen, D.P., (2010), Final Report on the Collapse of the Dallas Cowboys Indoor Practice Facility, May 2, 2009, NISTIR 7661, Gaithersburg, MD, January.

Cost Impact: The code change proposal will increase the cost of construction. This proposed change may require an increase in capacity for some structural members. This increase will result in moderate increase in the overall cost of construction. It is believed that such a cost impact is justified on the basis of occupant safety.

G189-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3102.7.3-G-GROSS-SADEK.doc

G190 – 12
3103.1.1 (NEW)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Add new text as follows:

3103.1.1 Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, *means of egress*, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The International Code Council's Building Code Action Committee was asked to look at adding structural provisions and requirements for temporary structures. In the current code, the administrative requirements for temporary structures are located in section 108 while the technical requirements are in section 3103. In reviewing the existing code, it was the opinion of the BCAC that the two sections in the current code sufficiently address the requirements. However, the BCAC did determine that section 108.2, "Conformance", was more technical than administrative and that a code user may not be aware of those requirements when looking at section 3103 for the technical requirements. To address this and to avoid potential confusion or oversight, the BCAC proposes moving the technical language of section 108.2 to section 3103.1.1.

Cost Impact: The code change will not increase the cost of construction.

G190-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3103.1.1 (NEW)-G-BAJNAI.doc

G191 – 12
3104.1.1 (NEW), 3104.2, 3104.5

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

3104.1 General This section shall apply to connections between buildings such as *pedestrian walkways* or tunnels, located at, above or below grade level, that are used as a means of travel by persons. The *pedestrian walkway* shall not contribute to the *building area* or the number of *stories* or height of connected buildings.

3104.1.1 Application. Pedestrian walkways shall be designed and constructed in accordance with Sections 3104.2 through 3104.9. Tunnels shall be designed and constructed in accordance with Section 3104.2 and 3104.10.

3104.2 Separate structures. ~~Connected~~ Buildings connected by pedestrian walkways or tunnels shall be considered to be separate structures.

Exceptions:

1. Buildings that are on the same *lot* and considered as portions of a single building in accordance with Section 503.1.2 ~~shall be considered a single structure~~.
2. For purposes of calculating the number of Type B units required by Chapter 11, structurally connected buildings and buildings with multiple wings shall be considered one structure.

3104.3 Construction. (No proposed changes)

3104.4 Contents. (No proposed changes)

3104.5 ~~Fire barriers between~~ Connections of pedestrian walkways ~~and~~ to buildings. The connection of a pedestrian walkway to a building shall comply with any one of the following: Section 3104.5.1, 3104.5.2, 3104.5.3 or 3104.5.4.

Exception: Buildings that are on the same lot and considered as portions of a single building in accordance with Section 503.1.2.

3104.5.1 Fire Barriers. Pedestrian walkways shall be separated from the interior of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 and Sections 3104.5.1.1 through 3104.5.1.3. ~~or *horizontal assemblies* constructed in accordance with Section 711, or both.~~

3104.5.1.1 Exterior walls. Exterior walls of buildings connected to pedestrian walkways shall be 2-hour fire-resistance-rated. This protection shall extend not less than ~~vertically from a point~~ 10 feet (3048 mm) in every direction surrounding the perimeter of the pedestrian walkway. ~~above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm) from each side of the *pedestrian walkway*~~.

3104.5.1.2. Openings in exterior walls of connected building. Openings ~~within the l0-foot (3048 mm) horizontal extension of the protected walls beyond the walkway~~ in exterior walls required to be fire-resistance rated in accordance with Section 3104.5.1.1 shall be equipped with ~~devices~~ opening protectives providing a minimum 3/4-hour *fire protection rating* in accordance with Section 716.

3104.5.1.3 Supporting Construction. The fire barrier shall be supported by construction as required by Section 707.5.1.

~~**Exception:** The walls separating the *pedestrian walkway* from a connected building and the openings within the 10- foot (3048 mm) horizontal extension of the protected walls beyond the walkway are not required to have a *fire-resistance rating* by this section where any of the following conditions exist:~~

~~1. The distance between the connected buildings is more than 10 feet (3048 mm). The *pedestrian walkway* and connected buildings, except for *open parking garages*, are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~

3104.5.2. Alternative separation. The wall separating the pedestrian walkway and the building shall comply with Section 3104.5.2.1 or 3104.5.2.2 when:

1. The distance between the connected buildings is more than 10 feet (3048 mm)
2. The *pedestrian walkway* and connected buildings, are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, and the roof of the walkway is not more than 55 feet above grade connecting to the fifth, or lower, story above grade plain, of each building

   Exception: Open parking garages need not be equipped with an automatic sprinkler system.

3104.5.2.1 Passage of smoke. The wall ~~is~~ shall be capable of resisting the passage of smoke. ~~or is constructed of a tempered, wired or laminated glass wall and doors subject to the following:~~

~~1.1. The wall or glass separating the interior of the building from the *pedestrian walkway* shall be protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1 and the sprinkler system shall completely wet the entire surface of interior sides of the wall or glass when actuated;~~
~~1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates; and~~
~~1.3. Obstructions shall not be installed between the sprinkler heads and the wall or glass.~~

3104.5.2.2 Glass. The wall shall be constructed of a tempered, wired or laminated glass wall and doors or glass separating the interior of the building from the *pedestrian walkway.* The glass shall be protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1, that,-when actuated , shall completely wet the entire surface of interior sides of the wall or glass. Obstructions shall not be installed between the sprinkler heads and the wall or glass. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates.

~~2.~~ **3104.5.3 Open sides on walkway.** Where the distance between the connected buildings is more than 10 feet (3048 mm) the walls at the intersection of the pedestrian walkway and each building need not be fire-resistance rated provided ~~and~~ both sidewalls of the *pedestrian walkway* are not less than 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and *toxic* gases. The roof of the walkway shall be located not more than 40 ft. above grade plane, and the walkway shall only be permitted to connect to the third or lower story of each building.

Exception: Where the pedestrian walkway is protected with a sprinkler system in accordance with Section 903.3.1.1, the roof of the walkway shall be located not more than 55 ft. above grade plane, and the walkway shall only be permitted to connect to the fifth or lower story of each building.

~~3. Buildings are on the same *lot* in accordance with Section 503.1.2.~~

~~4~~ **3104.5.4 Exterior walls greater than 2 hours.** Where *exterior walls* of connected buildings are required by Section 705 to have a *fire-resistance rating* greater than 2 hours, the pedestrian walkway shall:

1. Be equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, and
2. Have the roof of the walkway located not more than 55 feet above grade plane, and the walkway shall only be permitted to connect to the fifth, or lower, story above grade plane, of each building.

~~The previous exception shall apply to *pedestrian walkways* having a maximum height above grade of three *stories* or 40 feet (12 192 mm), or five *stories* or 55 feet (16 764 mm) where sprinklered.~~

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx..

The purpose of this code change proposal is to reorganize the provisions of Section 3104.5, regarding the separation options for pedestrian walkways from the buildings they connect. At present, Section 3104.5 relies upon a group of exceptions to provide the requirements for various options for separation of a pedestrian walkway from the buildings to which it is connected. The intent of this proposal is not make any modifications to these technical requirements; it simply writes the section in a format that logically lays out the options available in a direct manner, rather than as exceptions. This is, in our opinion, less confusing.

In addition, an editorial change was made to the two exceptions regarding buildings on the same lot. Section 503.1.2 states that two buildings on the same lot can be treated as separate buildings, or as portions of a single building. These exceptions were always intended to refer to the segment of Section 503.1.2 where two buildings are considered portions of a single building. The exceptions were rewritten to make that clear.

Finally, the existing language is unclear regarding the protection provided under the provisions now numbered 3104.5.1. Existing text states that the separation between the building and the walkway is to be a fire barrier and it then implies the fire barrier extends to the surrounding exterior walls. As fire barriers are an internal element and not an exterior wall element, the provisions of 3104.5 are revised to clarify how the 'protection' continues surrounding the walkway. Section 3104.5.1.3, while it appears to be a new provision, is merely a reminder of the requirements for supporting construction found in Section 707. Providing the reference will provide more consistent application.

Cost Impact: None.

G191-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3104.1-G-BAJNAI-BCAC.doc

G192 – 12
3105.4

Proponent: Lee J. Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development (lkranz@bellevuewa.gov)

Revise as follows:

3105.4 Awning and canopy materials. Awnings and c*anopies* shall be ~~constructed of a rigid framework~~ provided with an *approved* covering that meets the fire propagation performance criteria of NFPA 701 or has a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

Reason: The code does not currently provide a means for building officials to regulate the fire propagation performance and flame spread requirements for materials covering awnings afforded for canopies. This is resolved by adding "awnings" to this section. The words "constructed of a rigid framework…" is deleted as it is already included in the definitions of awning and canopy.

Cost Impact: This code change will not increase the cost of construction.

G192-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3105.4-G-KRANZ.doc

G193 – 12

PART I – INTERNATIONAL BUILDING CODE
202, 303.4 (IFC 202), 303.5 (IFC 202), 507.6, 507.7, Table 1004.1.2 (IFC [B] Table 1004.1.2), 1808.7.3, 2406.4.5, 2609.4, 3109, 3102.8.3, G801.5
PART II – INTERNATIONAL MECHANICAL CODE
202, 403.2.1, Table 403.3, 916, Table 916, 1401.1
PART III – INTERANTIONAL FUEL GAS CODE
202, 617.1
PART IV – INTERNATIONAL PLUMBING CODE
IPC 202, 423.1, 612.1, 801.1, 802.1.4; IPSDC 202 401.3.2, Table 406.1, Table 604.1(2), Table 802.7.2, Table 802.8

Proponents: Kris Bridges, CBO, Chair, ICC Swimming Pool Code Drafting Committee (SPCDC) & Jennifer Hatfield, J. Hatfield & Associates, PL, representing the Association of Pool & Spa Professionals

THIS IS A 4 PART CODE CHANGE.PART All PARTS WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOPMENT COMMITTEE.

PART I – IBC GENERAL

Delete Section 3109 in its entirety and substitute as follows:

SECTION 3109
AQUATIC VESSELS

3109.1 General. The design and construction of aquatic vessels shall comply with the *International Swimming Pool and Spa Code*. The application of this section shall be limited in scope in accordance with Section 101.2.

Revise as follows:

303.4 Assembly Group A-3. Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades
Art galleries
Bowling alleys
Community halls
Courtrooms
Dance halls (not including food or drink consumption)
Exhibition halls
Funeral parlors
Gymnasiums (without spectator seating)
Indoor ~~*swimming pools*~~ *aquatic vessels* (without spectator seating)
Indoor tennis courts (without spectator seating)
Lecture halls
Libraries
Museums
Places of religious worship
Pool and billiard parlors
Waiting areas in transportation terminals

303.5 Assembly Group A-4. Assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:
Arenas
Skating rinks
~~*Swimming pools*~~ *Aquatic vessels*
Tennis courts

Revise as follows:

507.6 Group A-3 buildings of Type II construction. The area of a Group A-3 building no more than one *story above grade plane*, used as a *place of religious worship*, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor ~~*swimming pool*~~ *aquatic vessel* or tennis court of Type II construction, shall not be limited provided all of the following criteria are met:

1. The building shall not have a *stage* other than a *platform*.
2. The building shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. The building shall be surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

507.7 Group A-3 buildings of Types III and IV construction. The area of a Group A-3 building of Type III or IV construction, with no more than one *story above grade plane*, and used as a *place of religious worship*, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor ~~*swimming pool*~~ *aquatic vessel* or tennis court, shall not be limited provided all of the following criteria are met:

1. The building shall not have a *stage* other than a *platform*.
2. The building shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21inches (533 mm) of street or grade level and all *exits* are provided with ramps complying with Section 1010.1 to the street or grade level.
4. The building shall be surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Revise as follows:

TABLE 1004.1.2 (IFC [B] TABLE 1004.1.2)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Skating rinks~~, swimming pools~~ Rink ~~and pool~~ Decks	 50 gross 15 gross
Aquatic Vessels and Aquatic Recreation Facility	Occupant load factors shall be determined in accordance with the International Swimming Pools & Spa Code (ISPSC)

(Portion of table not shown remains unchanged)

Revise as follows:

1808.7.3 ~~Pools~~ Aquatic vessels. The setback between ~~pools~~ aquatic vessel s regulated by this code and slopes shall be equal to one-half the building footing setback distance required by this section. That portion of the ~~pool~~ aquatic vessel wall within a horizontal distance of 7 feet (2134 mm) from the top of the slope shall be capable of supporting the water in the ~~pool~~ aquatic vessel without soil support.

Revise as follows:

2406.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor ~~swimming pool~~ aquatic vessels where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface shall be considered a hazardous location. This shall apply to single glazing and all panes in multiple glazing.

> **Exception:** Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub~~, hot tub, spa, whirlpool, or swimming pool~~ or aquatic vessel.

Revise as follows:

2609.4 Area limitations. Roof panels shall be limited in area and the aggregate area of panels shall be limited by a percentage of the floor area of the room or space sheltered in accordance with Table 2609.4.

Exceptions:

1. The area limitations of Table 2609.4 shall be permitted to be increased by 100 percent in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Low-hazard occupancy buildings, such as ~~swimming pool~~ aquatic vessel shelters, shall be exempt from the area limitations of Table 2609.4, provided that the buildings do not exceed 5,000 square feet (465 m^2) in area and have a minimum fire separation distance of 10 feet (3048 mm).
3. Greenhouses that are occupied for growing plants on a production or research basis, without public access, shall be exempt from the area limitations of Table 2609.4 provided they have a minimum fire separation distance of 4 feet (1220 mm).
4. Roof coverings over terraces and patios in occupancies in Group R-3 shall be exempt from the area limitations of Table 2609.4 and shall be permitted with light-transmitting plastics.

Revise as follows:

3102.8.3 Support provisions. A system capable of supporting the membrane in the event of deflation shall be provided for in air-supported and air-inflated structures having an *occupant load* of 50 or more or where covering ~~a swimming pool~~ an aquatic vessel regardless of *occupant load*. The support system shall be capable of maintaining membrane structures used as a roof for Type I construction not less than 20 feet (6096 mm) above floor or seating areas. The support system shall be capable of maintaining other membranes not less than 7 feet (2134 mm) above the floor, seating area or surface of the water.

Add new definition as follows:

SECTION 202
DEFINITIONS

AQUATIC RECREATION FACILITY. A facility that is designed for free-form aquatic play and recreation. The facilities may include, but are not limited to, wave or surf action pools, leisure rivers, sand bottom pools, vortex pools, *activity pools*, *tube rides* and body slides, and interactive play attractions.

AQUATIC VESSEL. Any vessel, permanent or temporary, intended for swimming, bathing, or wading and that is designed and manufactured to be connected to a *circulation system*. Portable vessels 12 inches or less in designed water depth which are drained and filled daily are not considered *aquatic vessels*. For purposes of this code, the term is used to identify all the types of vessels governed by this code, including: swimming pools, aquatic facilities, *spas* and hot tubs, and related equipment. Such vessels are either used in a *residential* application or in a public application.

Delete without substitution:

~~**G801.5 Prefabricated swimming pools.** Prefabricated swimming pools in *floodways* shall meet the requirements of Section G103.5.~~

PART II – IMC

Revise as follows:

IMC 403.2.1 Recirculation of air. The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a ~~swimming pool~~ aquatic vessel and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.
4. Where mechanical exhaust is required by Note g in Table 403.3, mechanical exhaust is required and recirculation is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.

IMC TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT[2a]	DEFAULT OCCUPANT DENSITY #/1000 FT[2a]	EXHAUST AIRFLOW RATE CFM/FT[2a]
Sports and amusement ~~Swimming pools~~ Aquatic vessels (pool and deck area)	--	0.48	--	--

IMC SECTION 916
~~**POOL AND SPA**~~ **AQUATIC VESSEL HEATERS**

IMC 916.1 General. ~~Pool and spa~~ Aquatic vessel heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired ~~pool and spa~~ aquatic vessel heaters shall be tested in accordance with UL 726. Electric p~~ool and spa~~ aquatic vessel heaters shall be tested in accordance with UL 1261.

IMC 1401.1 Scope. This chapter shall govern the design, construction, installation, alteration and repair of systems, equipment and appliances intended to utilize solar energy for space heating or cooling, domestic hot water heating, ~~swimming pool~~ aquatic vessel heating or process heating.

Add new definition as follows: *(Same definition as in IBC)*

IMC SECTION 202
DEFINITIONS

<u>**AQUATIC VESSEL.** Any vessel, permanent or temporary, intended for swimming, bathing, or wading and that is designed and manufactured to be connected to a *circulation system*. Portable vessels 12 inches or less in designed water depth which are drained and filled daily are not considered *aquatic vessels*. For purposes of this code, the term is used to identify all the types of vessels governed by this code, including: swimming pools, aquatic facilities, *spas* and hot tubs, and related equipment. Such vessels are either used in a *residential* application or in a public application.</u>

PART III – IFGC

Revise as follows:

IFGC SECTION 617
~~POOL AND SPA~~ <u>AQUATIC VESSEL</u> HEATERS

IFGC 617.1 General. ~~Pool and spa~~ <u>Aquatic vessel</u> heaters shall be tested in accordance with ANSI Z21.56 and shall be installed in accordance with the manufacturer's installation instructions.

Add new definition as follows: *(Same definition as in IBC)*

IFGC SECTION 202
DEFINITIONS

<u>**AQUATIC VESSEL.** Any vessel, permanent or temporary, intended for swimming, bathing, or wading and that is designed and manufactured to be connected to a *circulation system*. Portable vessels 12 inches or less in designed water depth which are drained and filled daily are not considered *aquatic vessels*. For purposes of this code, the term is used to identify all the types of vessels governed by this code, including: swimming pools, aquatic facilities, *spas* and hot tubs, and related equipment. Such vessels are either used in a *residential* application or in a public application.</u>

PART IV – IPC/IPSDC

Revise as follows:

IPC 423.1 Water connections. Baptisteries, ornamental and lily pools, aquariums, ornamental fountain basins, ~~swimming pools~~ <u>aquatic vessels</u>, and similar constructions, where provided with water supplies, shall be protected against backflow in accordance with Section 608.

IPC 612.1 Solar systems. The construction, installation, alterations and repair of systems, equipment and appliances intended to utilize solar energy for space heating or cooling, domestic hot water heating, ~~swimming pool~~ <u>aquatic vessel</u> heating or process heating shall be in accordance with the International Mechanical Code.

IPC 801.1 Scope. This chapter shall govern matters concerning indirect waste piping and special wastes. This chapter shall further control matters concerning food-handling establishments, sterilizers, clear-water wastes, ~~swimming pools~~ <u>aquatic vessels</u>, methods of providing air breaks or air gaps, and neutralizing devices for corrosive wastes.

IPC 802.1.4 ~~Swimming pools~~ <u>Aquatic vessels</u>. Where wastewater from ~~swimming pools~~ <u>aquatic vessels</u>, backwash from filters and water from ~~pools~~ <u>aquatic vessel</u> deck drains discharge to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap.

Delete and substitute definition as follows: *(Same definition as in IBC)*

IPC SECTION 202
DEFINITIONS

~~**SWIMMING POOL**. Any structure, basin, chamber or tank containing an artificial body of water for swimming, diving or recreational bathing having a depth of 2 feet (610 mm) or more at any point.~~

AQUATIC VESSEL. Any vessel, permanent or temporary, intended for swimming, bathing, or wading and that is designed and manufactured to be connected to a *circulation system*. Portable vessels 12 inches or less in designed water depth which are drained and filled daily are not considered *aquatic vessels*. For purposes of this code, the term is used to identify all the types of vessels governed by this code, including: swimming pools, aquatic facilities, *spas* and hot tubs, and related equipment. Such vessels are either used in a *residential* application or in a public application.

Revise IPSDC as follows:

IPSDC 401.3.2 Undisturbed site. The replacement system shall not be disturbed to the extent that the site area is no longer suitable. The replacement system area shall not be used for construction of buildings, parking lots or parking areas, below-ground ~~swimming pools~~ aquatic vessels or any other use that will adversely affect the replacement area.

IPSDC TABLE 406.1
MINIMUM HORIZONTAL SEPARATION DISTANCES FOR SOIL ABSORPTION SYSTEMS

ELEMENT	DISTANCE (feet)
~~**Swimming Pool**~~ **Aquatic vessel**	**15**

(Portions of table not shown remain unchanged)

IPSDC TABLE 604.1(2)
CONVERSION FACTOR

BUILDING CLASSIFICATION	UNITS	FACTOR
~~Swimming pool~~ Aquatic vessel bathhouse	1 per person	0.2

(Portions of table not shown remain unchanged)

IPSDC TABLE 802.7.2
ADDITIONAL CAPACITY FOR OTHER BUILDINGS

BUILDING CLASSIFICATION	CAPACITY (GALLONS)
~~Swimming pool~~ Aquatic vessel bathhouses (per person)	10

(Portions of table not shown remain unchanged)

IPSDC TABLE 802.8
MINIMUM HORIZONTAL SEPARATION DISTANCES FOR TREATMENT TANKS

ELEMENT	DISTANCE (feet)
~~Swimming pool~~ Aquatic vessel	**15**

(Portions of table not shown remain unchanged)

Add new definition as follows: *(Same definition as in IBC)*

IPSDC SECTION 202
DEFINITIONS

AQUATIC VESSEL. Any vessel, permanent or temporary, intended for swimming, bathing, or wading and that is designed and manufactured to be connected to a *circulation system*. Portable vessels 12 inches or less in designed water depth which are drained and filled daily are not considered *aquatic vessels*. For purposes of this code, the term is used to identify all the types of vessels governed by this code, including: swimming pools, aquatic facilities, *spas* and hot tubs, and related equipment. Such vessels are either used in a *residential* application or in a public application.

Reason: 3109. When addressing pool safety provisions found in the new International Swimming Pool & Spa Code, reference to that code ensures consistency and provides additional pool and spa requirements that are important to follow for life safety reasons. By requiring in the IBC that aquatic vessels comply with the ISPSC, proper construction of the aquatic vessel will occur, providing the end user with a safe aquatic environment.

Table 1004.1.2. The new International Swimming Pool & Spa Code (ISPSC) provides occupant load requirements for aquatic recreation facilities (Table 608.1 of the ISPSC) and bather load requirements for public swimming pools (Table 403.1). In order to provide consistency between the I-codes, this proposal provides a new entry into Table 1004.1.2 that references you to the ISPSC requirements that provide a more detailed occupant load requirement based on what type of aquatic vessel and what area of the vessel is being considered.

202. The new International Swimming Pool & Spa Code (ISPSC) utilizes a new definition to encompass all different types of pools, hot tubs, and spas – aquatic vessel. The ISPSC also defines a public pool and an aquatic recreation facility, both of which fall under the IBC purview. This proposal revises the definitions in accordance with the terminology provided in the new ISPSC, in order to provide consistency between I-codes and clarity on what requirements apply to what type of aquatic vessels (see subsequent proposal regarding Table 1004.1.2 of the IBC for example). Further, the current definition excludes wading pools 18 feet deep from any requirements, this new language ensure these types of aquatic vessels are covered.

G801.5 . The new International Swimming Pool & Spa Code (ISPSC) does not define prefabricated swimming pools. Rather, it uses the terminology "aquatic vessel" (which is also being suggested for inclusion in the IBC definitions in a separate proposal). Under the new ISPSC, requirements for the design and construction of aquatic vessels installed in flood hazard areas are provided in Section 304. This language should be deleted due to the ISPSC flood hazard area requirements, and due to the fact a prefabricated swimming pool is not defined.

IMC,IFGC, IPC and IPSDC. The new International Swimming Pool & Spa Code (ISPSC) utilizes a new definition to encompass all different types of pools, hot tubs, and spas – aquatic vessel. This proposal utilizes the new terminology found in the ISPSC for consistency between the I-codes.

Cost Impact: The code change proposal will not increase the cost of construction.

G193-12

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	D

PART II – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	D

PART III – IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	D

PART IV – IPC/IPSDC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G194 – 12
3109 (NEW), Chapter 35

Proponent: Carvin DiGiovanni, Association of Pool & Spa Professionals (cdigiovanni@apsp.org)

Delete entire Section 3109 and replace as follows:

~~**SECTION 3109**~~
~~**SWIMMING POOL ENCLOSURES AND SAFTEY DEVICES**~~

SECTION 3109
AQUATIC VESSEL ENCLOSURES AND SAFETY DEVICES

3109.1 General. The provisions of this section shall apply to the design of barriers for all aquatic vessels. These design controls are intended to provide protection against the potential drowning and near drowning by restricting access to such vessels. These requirements provide an integrated level of protection against potential drowning through the use of physical barriers and warning devices.

Exceptions:

1. Spas and hot tubs with a lockable safety cover that complies with ASTM F1346.
2. Swimming pools with a powered safety cover that complies with ASTM F1346.

3109.2 Outdoor Swimming Pools. All outdoor aquatic vessels shall be surrounded by a barrier that complies with Sections 3109.2.1 through 3109.8.

3109.2.1 Barrier height and clearances. Barrier heights and clearances shall be in accordance with all the following:

1. The top of the barrier shall be not less than 48 inches (1219 mm) above grade where measured on the side of the barrier that faces away from the aquatic vessel. Such height shall exist around the entire perimeter of the vessel and for a distance of 3 feet (914 mm) where measured horizontally from the required barrier.
2. The vertical clearance between grade and the bottom of the barrier shall not exceed 2 inches (51 mm) for grade surfaces that are not solid, such as grass or gravel, where measured on the side of the barrier that faces away from the vessel.
3. The vertical clearance between a surface below the barrier to a solid surface, such as concrete, and the bottom of the required barrier shall not exceed 4 inches (102 mm) where measured on the side of the required barrier that faces away from the vessel.
4. Where the top of the vessel structure is above grade, the barrier shall be installed on grade or shall be mounted on top of the vessel structure. Where the barrier is mounted on the top of the vessel, the vertical clearance between the top of the vessel and the bottom of the barrier shall not exceed 4 inches (102 mm).

3109.2.2 Openings. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.

3109.2.3 Solid barrier surfaces. Solid barriers that do not have openings shall not contain indentations or protrusions that form handholds and footholds, except for normal construction tolerances and tooled masonry joints.

3109.2.4 Mesh restraining barrier/fence. Mesh fences, other than chain link fences in accordance with Section 3109.2.7, shall be installed in accordance with the manufacturer's instructions and shall comply with the following:

1. The bottom of the mesh restraining fence shall be not more than 1 inch (25 mm) above the deck or installed surface or grade.
2. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not permit the fence to be lifted more than four (4) inches (102 mm) from grade or decking.
3. The fence shall be designed and constructed so that it does not allow passage of a 4-inch sphere under any mesh panel. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not be more than four (4) inches (102 mm) from grade or decking.
4. An attachment device shall attach each barrier section at a height not lower than 45 inches (1143 mm) above grade. Common attachment devices include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring-actuated retaining lever such as a safety gate hook.
5. Where a hinged gate is used with a mesh barrier, the gate shall comply with Section 3109.3.
6. Patio deck sleeves such as vertical post receptacles which are placed inside the patio surface shall be of a nonconductive material.
7. Mesh fences shall not be used on top of on ground residential pools.

3109.2.5 Closely spaced horizontal members. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the aquatic vessel side of the fence. Spacing between vertical members shall not exceed 1.75 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.

3109.2.6 Widely spaced horizontal members. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.

3109.2.7 Chain link dimensions. The maximum opening formed by a chain link fence shall be not more than 1.75 inches (44 mm). Where the fence is provided with slats fastened at the top and bottom which reduces the openings, such openings shall be not more than 1.75 inches (44 mm).

3109.2.8 Diagonal members. Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than 1.75 inches (44 mm). The angle of diagonal members shall not be greater than 45 degrees from vertical.

3109.2.9 Clear Zone. There shall be a clear zone of not less than 36 inches (914 mm) around the exterior of the barrier and around any permanent structures or equipment such as pumps, filters and heaters that can be used to climb the barrier.

3109.2.10 Poolside Barrier Setbacks. The aquatic vessel side of the required barrier shall be not less than 20 inches (508 mm) from the water's edge.

3109.3 Gates. Access gates shall comply with the requirements of Sections 3109.3.1 through 3109.3.3 and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the vessel and shall be self-closing and have a self-latching device.

3109.3.1 Utility or Service Gates. Gates not intended for pedestrian use, such as utility or service gates, shall remain locked when not in use.

3109.3.2 Double or multiple gates. Double gates or multiple gates shall have at least one leaf secured in place and the adjacent leaf shall be secured with a self-latching device. The gate and barrier shall not have openings larger than 1/2 inch (12.7 mm) within 18 inches (457 mm) of the latch release mechanism. The self-latching device shall comply with the requirements of Section 3109.3.3.

3109.3.3 Latches. Where the release mechanism of the self-latching device is located less than

54 inches (1372 mm) from grade, the release mechanism shall be located on the vessel side of the gate at least 3 inches (76 mm) below the top of the gate, and the gate and barrier shall not have openings greater than 1/2 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

3109.4 Structure wall as a barrier. Where a wall of a dwelling or structure serves as part of the barrier, doors and operable windows with a sill height of less than 48 inches (1219 mm), that provide direct access to the aquatic vessel through the wall, shall be equipped with one or more of the following:

1. An alarm that produces an audible warning when the door or its screen or window, is opened. The alarm shall be listed and labeled as a water hazard entrance alarm in accordance with UL 2017. In dwellings or structures not required to be Accessible units, Type A units or Type B units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings or structures required to be Accessible units, Type A units or Type B units, the deactivation switch shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1219 mm) above the threshold of the door.
2. A safety cover that is listed and labeled in accordance with ASTM F1346.
3. An approved means of protection, such as self-closing doors with self-latching devices, provided that the degree of protection afforded is not less than the protection afforded by Items 1 and 2.

3109.5 Pool structure as a barrier. Where an on ground residential pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, the following shall apply:

1. An on ground pool wall, itself, shall be permitted to be the barrier where the pool structure is on grade and the wall is at least 48 inches (1219 mm) above grade for the entire perimeter of the pool and complies with the requirements of Section 3109.3.
2. Where the means of access is a ladder or steps, the ladder or steps shall be capable of being secured, locked or removed to prevent access or the ladder or steps shall be surrounded by a barrier that meets the requirements of this section.
3. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.
4. The barrier shall be installed in accordance with the manufacturer's instructions.

3109.6 Natural barriers. In the case where the vessel area abuts the edge of a lake or other natural body of water, public access is not permitted or allowed along the shoreline, and required barriers extend to and beyond the water's edge a minimum of 18 inches (457 mm), a barrier is not required between the natural body of water shoreline and the vessel.

3109.7 Natural topography. Natural topography that prevents direct access to the aquatic vessel area shall include but not be limited to mountains and natural rock formations. A natural barrier approved by the governing body shall be acceptable provided that the degree of protection is not less than the protection afforded by the requirements of Sections 3109.2 through 3109.5.

3109.8 Indoor swimming pools. Indoor aquatic vessels shall be surrounded by a barrier that meets the requirements of Sections 3109.2.1 through 3109.7.

3109.9 Multiple aquatic vessels. Multiple aquatic vessels within a single complex shall be permitted without barriers where a barrier separates the single complex from the surrounding property in accordance with Section 3109.1 through 3109.8.

3109.10 Suction entrapment avoidance. Suction entrapment for aquatic vessels shall be provided in accordance with ANSI/APSP-7.

> **Exception:** Portable residential spas and portable residential exercise spas listed and labeled in accordance with UL 1563 or CSA C22.2 No. 218.1.

Add new standards to Chapter 35 as follows:

UL

UL 1563- 2009 Electric Spas, Equipment Assemblies, and Associated Equipment

CSA

CSA C22.2 No. 218.1- 2011 Spas, Hot Tubs and Associated Equipment

Reason: This proposal provides a re-write of Section 3109 to ensure consistency with the barrier and entrapment avoidance provisions found in the new International Swimming Pool & Spa Code under Chapter 3. If the I-codes are not consistent, confusion on what to follow will occur for the contractor and building department. Further and most importantly, if the two I-codes are not consistent, important life safety requirements may not be followed correctly.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The new standards proposed for referencing within the IBC are currently referenced in the International Pool and Spa Code., UL 1563-2009 and CSA C22.2 No. 218.1-2011.

Staff note: There are provisions for latches on doors/gates to pools in Sections 1008.1.9.2 and 1109.13. This proposal includes requirements for latches on doors/gates to pools in Section 3109.3.3 and 3109.4.

G194-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3109 (NEW)-G-DIGIOVANNI.doc

G195 – 12
3109.4

Proponent: Steve Pfeiffer, City of Seattle, Dept. of Planning & Development (steve.pfeiffer@seattle.gov)

Revise as follows

3109.4 Residential swimming pools. Residential swimming pools shall ~~comply~~ be completely enclosed by a barrier complying with Sections 3109.4.1 through 3109.4.3.

> **Exception:** A swimming pool with a power safety cover or a spa with a safety cover complying with ASTM F 1346 need not comply with Section 3109.4.

Reason: The purpose of this change is to clarify the location where barriers are required at a residential swimming pool. The current code provisions specify how to construct a barrier, but don't specify that the pool must be entirely surrounded by the barrier. The proposed language is similar to Section 3109.3 for public swimming pools.

Cost Impact: The code change proposal will not increase the cost of construction.

G195-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3109.4-G-PFEIFFER.doc

G196 – 12
3109.5, Chapter 35

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

3109.5 Entrapment avoidance. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

Exception: Self-contained spas *listed* and *labeled* in accordance with UL 1563.

Add new standard to Chapter 35 as follows:

UL
1563-2009 Electric Spas, Equipment Assemblies, and Associated Equipment, including revisions through April 29, 2011

Reason: Integral entrapment protection is required by UL 1563. UL 1563 is an ANSI approved standard. New language will correlate with code requirements in the ISPSC.

Cost Impact: The proposed changes will not increase the cost of construction.

Analysis: This standard is already referenced in the *International Pool and Spa Code*.

G196-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3109.5-G-EUGENE.doc

G197 – 12
3111.1.1 (NEW)

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Add new text as follows:

<u>**3111.1.1 Rooftop-mounted solar photovoltaic panels and modules.** Solar photovoltaic panels and modules installed upon a roof or as an integral part of a roof assembly shall comply with the requirements of Chapter 15 and the *International Fire Code.*</u>

Reason: This code change proposal is intended to add clarity to the Code. Rooftop-mounted solar photovoltaic panels and modules are addressed in Chapter 15-Roof Assemblies and Rooftop Structures, specifically in Section 1505.8-Photovoltaic Systems, Section 1507.17-Photovoltaic Modules/Shingles and Section 1511-Solar Photovoltaic Panels/Modules.

Cost Impact: The code change proposal will not increase the cost of construction.

G197-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3111.1.1 (NEW)-G-GRAHAM.doc

G198 – 12
202, 107.2.6 (NEW), 3101.1, 3112 (NEW)

Proponent: Carl F. Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee (CTC)

Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, and towers, ~~and~~ antennas, and relocatable buildings.

SECTION 3112
RELOCATABLE BUILDINGS

3112.1 General. The provisions of this section shall apply to relocatable buildings. Relocatable buildings manufactured after the effective date of this code shall comply with the applicable provisions of this code.

3112.1.1 Compliance. A relocatable building transported to a new location, or a relocatable building that is undergoing *alteration or additions* shall comply with Section 3410.

3112.2 Supplemental information. Supplemental information specific to a relocatable building shall be submitted to the authority having jurisdiction, and shall, *as a minimum,* include all of the following:

1. Application for approval or permit
2. Manufacturer's name, address, contact information
3. Date of manufacture
4. Serial number of module
5. Manufacturer's design drawings
6. Type of construction in accordance with Section 602.
7. Occupancy type in accordance with Section 302.
8. Design loads including: roof live load, roof snow load, floor live load, wind load and seismic site class, use group and design category
9. Additional building planning and structural design data
10. Site plan indicating the location of the relocatable building
11. Site built structure or appurtenance attached to the relocatable building

3112.3 Manufacturer's Data Plate. The manufactures data plate shall be the basis for determining code compliance. Each relocatable module shall have a data plate that is posted in the location as noted on the drawings, and shall include the following information:

1. Manufacturer's name and address
2. Serial number
3. Date of manufacture
4. The quality assurance agency or approved inspection agency
5. Codes, and standards of construction
6. Design live roof load, design live floor load, snow load, wind and seismic design
7. Envelope thermal resistance values
8. Electrical service size
9. Fuel burning equipment and size
10. Special limitations if any

3112.4 Inspections. Inspections of a relocatable building shall be performed in accordance with Section 110.4 of this code during off-site construction, and the applicable sections of Section 110.3 during installation at the site.

Add new definition as follows:

SECTION 202
DEFINITIONS

RELOCATABLE BUILDING. A partially or completely assembled building constructed and designed to be reused multiple times and transported to different building sites.

Add new text as follows:

107.2.6 Relocatable buildings. Construction documents for relocatable buildings shall comply with this section and Section 3112.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Unlike site-built buildings, which are typically intended to remain on their original site for the life of the building, relocatable modular buildings are designed and intended for relocation, reuse and/or repurposing. Many states have statutes that govern the building and relocating of relocatable modular buildings. For those that do not have state mandated requirements, much confusion and inconsistency exists about the requirements for relocatable modular buildings as existing buildings.

The Modular Building Institute (MBI) (www.modular.org) estimates that there are over 600,000 code compliant relocatable buildings in use in North America today. While it is impossible to determine the exact amount owned by the public at large, MBI estimates that public school districts across North America collectively own and operate about 180,000 relocatable classrooms with the industry owning and leasing an additional 120,000. Additionally, the industry owns and leases approximately 280,000 relocatable buildings for various other business occupancies, including construction site offices and temporary sales offices.

The Code Technology Committee Study Group on Relocatable Modular Buildings identified a number of unique characteristics of relocatable modular buildings that are unlike site-built buildings. Their findings are as follows:

- There are sections of the IBC that are applicable equally to both site-built and relocatable modular buildings, particularly for new construction.
- There are sections of the conflicting code sections that cannot be applied to both site-built and relocatable modular buildings, specifically related to construction documents, inspection, and relocation.

The IBC does not have specific requirements on how to treat these buildings. In the absence of clear definitions and requirements that are specific to both new and existing relocatable modular buildings, many code officials attempt to apply similar, but non-related sections of the building code intended for site built buildings to the relocatable modular industry. There are unique attributes to relocatable modular buildings that warrant their own requirements in a new chapter in this code.

CTC has submitted two proposals on the subject of relocatable modular buildings. One proposal for new construction (this proposal) and a second proposal to address the relocation of modular buildings (proposal to Chapter 34). This proposal includes:

- The definition has been distilled from industry publications and definitions found in state statutes that govern modular (industrialized) buildings. This definition was also approved in the 2012 IGCC.
- Identification and inclusion of relocatables into Special Construction, Chapter 31. This chapter applies to new relocatable buildings, and also new site built structures.

Moving this document forward through the ICC code development process will help the modular building industry comply with the intent of the code, provide a clear and consistent path for enforcement professionals, and for compliance by owners of relocatable buildings who wish to re-use or repurpose their existing buildings.

Cost impact: This code change proposal will not increase the cost of construction due to the re-usable/relocatable nature of such buildings.

G198-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G199 – 12

202, Table 503, 1609.1.2, 2405.3, 2606.11, 2607.4, 2609.4, 3112 (NEW), 3102.1

Proponent: Vickie J. Lovell, InterCode Incorporated, representing National Greenhouse Manufacturers Association (vickie@InterCodeinc.com)

Add new text as follows:

SECTION 3112
GREENHOUSES

3112.1 General. The provisions of this section shall apply to structures defined as greenhouses that are designed and used primarily for the cultivation, maintenance, or protection of plants. Greenhouses are constructed for agricultural production, educational purposes, research, retail or business uses.

3112.2 Definitions. The following terms are defined in Chapter 2.

GREENHOUSE
ATTACHED GREENHOUSE

3112.3 Occupancy. The occupancy provisions of this section shall apply to structures defined as greenhouses, and attached greenhouses.

3112.3.1 Group B. Greenhouses that are structurally attached to, but thermally isolated from college or university classrooms shall be classified as Group B.

3112.3.2 Group E. Greenhouses that are structurally attached to, but thermally isolated from elementary, middle or high school classrooms shall be classified as Group E.

3112.3.3 Group M. Greenhouses and attached greenhouses with access by the general access used primarily for the display and sale of plants shall be classified as Group M.

3112.3.4 Group U. Greenhouses that are any of the following shall be classified as Group U:

1. Greenhouses used primarily for the agricultural use for the production, cultivation, maintenance, or protection of plants.
2. Greenhouses that are accessory buildings to Group B, E, or M occupancies.
3. Utility or accessory greenhouses that are not classified in any specific occupancy.

3112.4 Type of Construction. Greenhouses shall be permitted to be constructed as Type I, II, III, IV or V construction. Combustible materials used in Type I and II construction shall be permitted in accordance with Section 603.

3112.5 Allowable Height and Area. The maximum allowable height and area for greenhouses shall comply with Table 3112.5. When an automatic sprinkler system is installed in accordance with Section 903.3.1.1, the values specified in Table 3112.5 for maximum building height is increased by 20 feet (6096mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the building area increase in accordance with Sections 506.2 and 506.3.

3112.5.1 One-story unlimited area. The area of a one-story Group U agricultural building shall not be limited if the building is surrounded and adjoined by *public ways* or yards not less than 60 feet (18 288 mm) in width.

3112.5.2 Two-story unlimited area. The area of a two-story Group U agricultural building shall not be limited if the building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width and is provided with an approved automatic sprinkler system throughout in accordance with Section 903.3.1.1.

TABLE 3112.5
BASIC ALLOWABLE AREA FOR GREENHOUSES

I		II		III and IV		V	
A	**B**	**A**	**B**	**III A and IV**	**III B**	**A**	**B**
ALLOWABLE AREA (square feet)a							
Unlimited	60,000	27,100	18,000	27,100	18,000	21,100	12,000
MAXIMUM HEIGHT IN STORIES							
Unlimited	12	4	2	4	2	3	2
MAXIMUM HEIGHT IN FEET							
Unlimited	160	65	55	65	55	50	40

3112.6 Mixed use and occupancy. Attached greenhouses shall comply with the requirements for mixed occupancies and use requirements in Section 508.

3112.6.1 Fire Rating. The fire rating for the exterior wall of an attached greenhouse classified as Group E, B, or M shall comply with Table 602. Where Table 705.3 permits nonbearing exterior walls with unlimited area of unprotected openings, the fire resistance rating for the exterior walls is 0 hours.

3112 7 Materials. Materials used for the exterior of greenhouses shall comply with Sections 3112.11 through 3112.12.5

3112.8 Means of egress. Greenhouses shall provide means of egress in accordance with Chapters 10.

3112. 9 Accessibility. Attached greenhouses with access by the general public in use Groups B, E, and M shall provide accessibility in accordance with Chapter 11.

3112.9.1 Use Group U. Greenhouses in use group U are exempt from Chapter 11 except as specified in this section.

3112.9.1.1 Employee work areas. Employees work areas shall comply with 1103.2.3 and 1104.3.1.

3112.9.1.2 Paved areas. Greenhouses with access to the general public shall be required to pave work areas and areas open to the general public in accordance with Section 1103.2.5.

3112.10 General Structural Design. Greenhouses with shall comply with the structural design requirements for live and dead loads appropriate for greenhouses in Chapter 16.

3112.10.1 Wind loads. All greenhouses are considered as Risk Category I as defined in Section 1604.5. Openings shall be permitted to be unprotected.

3112.11 Glass and Glazing. Glass and glazing used in greenhouses shall comply with Section 2405.

3112.11.1 Monolithic and multiple-layer sloped glazing systems. Glazing material, including annealed glass, is permitted to be installed without screens in the sloped glazing system of commercial greenhouses, or detached production greenhouses without public access, provided that the height of the greenhouse at the ridge does not exceed 30- feet (6096 mm) above grade.

3112.11.2 Greenhouse frames. Greenhouse frames shall be noncombustible if the height of the sloped glazing exceeds 30-feet (6096 mm) above grade.

3112.11.3 Energy. Greenhouses are exempt from fenestration requirements for U factor and SHGC, and envelope insulation of the International Energy Conservation Code.

3112.12 Light-transmitting Plastics. Light-transmitting plastics shall be permitted in lieu of plain glass in greenhouses and shall comply with Section 2606.

3112.12.1 Plastic wall panels. Greenhouses shall comply with Section 2607 for plastic wall panels. Greenhouses are not required to comply with the area limitations for plastic wall panels in Section 2607.4 but shall be limited as required for unprotected openings in accordance with 705.8

3112.12.2 Plastic glazing. Light transmitting plastic glazing shall comply with Section 2608.

3112.12.3 Plastic roof panels limitations. Greenhouses shall comply with Section 2609 for plastic roof panels. Greenhouses that have access by the general public are exempt from the area limitations of Table 2607.4 provided that the greenhouse has a minimum *fire separation distance* of 30 feet (1219 mm), or are equipped with an automatic sprinkler system in accordance with 903.3.1.1 and minimum fire separation distance of 4 feet (1219 mm). Group U greenhouses without access by the general public are exempt from the area limitations of Table 2607.4 provided that the greenhouse has a minimum fire separation distance of 4 feet (1219 mm).

3112.12.4 Shade and Curtain systems. Greenhouses that have access by the general public shall use material that is flame resistant with either of following:

1. Any textile shade or covering shall be flame resistant as determined by tests conducted in accordance with NFPA 701.
2. Any covering, other than textiles, shall have a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723 in the form intended for use.

Any material is permitted to be used in a shade or curtain system in greenhouses without general public access.

3112.12.5 Plastic film. Plastic less than 30 feet (9144mm) above any floor, and plastic interior liners less than 20 mil (0.5 mm) in thickness used in greenhouses used in greenhouses without access by the general public is not required to comply with 311212.4.

3112.13 Membrane Structures. Greenhouses that are air-inflated or air-supported shall comply with Section 3103.1. Greenhouses that use an arch or truss to support plastic film shall not be considered a membrane structure.

Add new definitions as follows:

GREENHOUSE. A structure designed and used primarily for the cultivation, maintenance, or protection of plants. Greenhouses may or may not be accessible to the general public.

ATTACHED GREENHOUSE. A greenhouse that is structurally attached to another building, but thermally isolated from the adjoining building.

Revise as follows:

3102.1 General. The provisions of Sections 3102.1 through 3102.8 shall apply to air-supported, air-inflated, membrane covered cable and membrane-covered frame structures, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the *International Fire Code*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, ~~greenhouses~~ and similar facilities not used for human occupancy are required to meet only the requirements of Sections 3102.3.1 and 3102.7.

Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

Revise as follows:

1609.1.2 Protection of openings. In *wind-borne debris regions*, glazing in buildings shall be impact resistant or protected with an impact-resistant covering meeting the requirements of an *approved* impact-resistant standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. Wood structural panels with a minimum thickness of $^7/_{16}$ inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings classified as Group R-3 or R-4 occupancy.

   Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where V_{asd} determined in accordance with Section 1609.3.1 does not exceed 140 mph (63 m/s).
2. Glazing in *Risk Category* I buildings as defined in Section 1604.5~~, including greenhouses that are occupied for growing plants on a production or research basis, without public access~~ shall be permitted to be unprotected.

   Exceptions:

   1. through 3. *(Portions of text not shown remain unchanged)*

Revise as follows:

2405.3 Screening. Where used in monolithic glazing systems, heat-strengthened glass and fully tempered glass shall have screens installed below the glazing material. The screens and their fastenings shall: (1) be capable of supporting twice the weight of the glazing; (2) be firmly and substantially fastened to the framing members and (3) be installed within 4 inches (102 mm) of the glass. The screens shall be constructed of a noncombustible material not thinner than No. 12 B&S gage (0.0808 inch) with mesh not larger than 1 inch by 1 inch (25 mm by 25 mm). In a corrosive atmosphere, structurally equivalent noncorrosive screen materials shall be used. Heat-strengthened glass, fully tempered glass and wired glass, when used in multiple-layer glazing systems as the bottom glass layer over the walking surface, shall be equipped with screening that conforms to the requirements for monolithic glazing systems.

Exception: In monolithic and multiple-layer sloped glazing systems, the following applies:

1. Fully tempered glass installed without protective screens where glazed between intervening floors at a slope of 30 degrees (0.52 rad) or less from the vertical plane shall have the highest point of the glass 10 feet (3048 mm) or less above the walking surface.
2. Screens are not required below any glazing material, including annealed glass, where the walking surface below the glazing material is permanently protected from the risk of falling glass or the area below the glazing material is not a walking surface.
3. ~~Any glazing material, including annealed glass, is permitted to be installed without screens in the sloped glazing systems of commercial or detached noncombustible greenhouses used exclusively for growing plants and not open to the public, provided that the height of the greenhouse at the ridge does not exceed 30 feet (9144 mm) above grade.~~
4. *(no change to text)*
5. *(no change to text)*

Revise as follows:

~~**2606.11 Greenhouses.** Light-transmitting plastics shall be permitted in lieu of plain glass in greenhouses.~~

2607.4 Area limitation and separation. The maximum area of a single wall panel and minimum vertical and horizontal separation requirements for exterior light-transmitting plastic wall panels shall be as provided for in Table 2607.4. The maximum percentage of wall area of any *story* in light-transmitting plastic wall panels shall not exceed that indicated in Table 2607.4 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.

Exceptions:

1. In structures provided with approved flame barriers extending 30 inches (760 mm) beyond the *exterior wall* in the plane of the floor, a vertical separation is not required at the floor except that provided by the vertical thickness of the flame barrier projection.
2. Veneers of approved weather-resistant light-transmitting plastics used as exterior siding in buildings of Type V construction in compliance with Section 1406.
3. ~~The area of light-transmitting plastic wall panels in *exterior walls* of greenhouses shall be exempt from the area limitations of Table 2607.4 but shall be limited as required for unprotected openings in accordance with Section 704.8.~~

2609.4 Area limitations. Roof panels shall be limited in area and the aggregate area of panels shall be limited by a percentage of the floor area of the room or space sheltered in accordance with Table 2609.4.

Exceptions:

1. The area limitations of Table 2609.4 shall be permitted to be increased by 100 percent in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Low-hazard occupancy buildings, such as swimming pool shelters, shall be exempt from the area limitations of Table 2609.4, provided that the buildings do not exceed 5,000 square feet (465 m_2) in area and have a minimum fire separation distance of 10 feet (3048 mm).
3. ~~Greenhouses that are occupied for growing plants on a production or research basis, without public access, shall be exempt from the area limitations of Table 2609.4 provided they have a minimum fire separation distance of 4 feet (1220 mm).~~
4. *(no change to text)*

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.
A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.
a. See the following sections for general exceptions to Table 503:
1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
2. Section 506.2, Allowable building area increase due to street frontage.
3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
4. Section 507, Unlimited area buildings.
5. <u>See Section 3112 for allowable height and area for greenhouses.</u>

b. through d. *(no change to text)*

Reason: Because the primary purpose of a greenhouse is for the propagation of plants, and not for human comfort, many typical building requirements are not applicable or necessary for greenhouses. This proposal has been submitted to distinguish the use and purpose of greenhouses, which better defines the applicable code requirements, and appropriate exceptions to the code.

The word “greenhouse” used throughout the IBC is too general of a term. Definitions and descriptions of greenhouses have been proposed that make the distinctions between the purposes of greenhouses, which better defines their occupancy classification.

Existing requirements for fire safety, structural, allowable height and area, accessibility, and other provisions for greenhouses have been extracted from the current code, and relocated into this new section without any significant technical changes. In two locations, Table 1604.3, 1607.12.2.1, it was impractical to remove the word “greenhouses” due to context. Some new sections have been added that are not presently addressed in the code, but are based on common, accepted practice for greenhouse construction. Some applicable text has been derived from Appendix C Agricultural Buildings.

Greenhouses are a type of unique structure, not a type of use group. Greenhouses fall into categories depending on their use. Greenhouse use groups include B, E, M, and U.

Two distinguishing features between types of greenhouses for the purposes of code enforcement is the access by the public or not and whether they are attached to another structure. These situations have been addressed in numerous locations within the proposal.

Although employees, students, faculty, or members of the general public may occupy the space, the primary function of a greenhouse is to create a controlled environment for the propagation and cultivation of plants, and is intended to achieve the optimum environment for the protection of the plants from the outside environment. Below are photos of typical types of greenhouses.

Greenhouse for display and retail sales of plants intended for general public access

Production greenhouse for agricultural use without public access

Greenhouses used by universities for research and scientific studies, access is limited to students and faculty.

T503 Appendix C contains the height and area requirements for greenhouses.

A proposal has been submitted to Chapter 31, Special Construction, that provides the allowable height and area requirements for greenhouses.

202. Currently, there is no definition for greenhouse in the IBC, although there are numerous requirements for greenhouses in the IBC.

Greenhouses fall into categories depending on their use. Greenhouse can fall into different use groups including B, E, M, and U. A proposal has been submitted to Chapter 31 to distinguish the use and purpose of greenhouses, and better define the applicable code requirements and appropriate exceptions to the code.

Although employees, students, faculty, or the general public may occupy the space, the primary function of a greenhouse is to create a controlled environment for the propagation or maintenance of plants, and to achieve the optimum environment for the protection of the plants from the outside environment.

Cost Impact: The code change proposal will not increase the cost of construction.

G199-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G200 – 12
3304.8 (NEW), 3311.3 (NEW)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Add new text as follows:

3304.8 Group I-2. For buildings employing a *defend in place* method in Group I-2 occupancies, an on-site fire watch shall be provided in accordance with the Section 901.7 of the *International Fire Code*.

3311.3 Group I-2. Temporary construction within corridors serving bed or stretcher movement in Group I-2 occupancies shall not reduce the corridor width to less than 60 inches.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

This change clarifies the code. Facilities that must remain operational during due to the critical nature of the service that they provide it is not feasible to evacuate the building for renovations. Healthcare facilities are routinely preplanning construction projects as to how the project will affect various fire and life safety functions and features in the building during the project.

However, this section reminds the plan reviewer to coordinate with the fire official for planned shut downs of fire safety equipment and provides and opportunity for the AHJ's to determine the appropriate interim life safety measures to ensure continued operation.

Temporary construction barriers are an operational necessity to contain construction dust, provide infection control, and prevent public entry into potentially hazardous areas. These barriers are required by facility infection control staff, industrial hygienists and other regulatory agencies. A new section of code is added to clarify that temporary construction may not reduce the corridor width to less than 60 inches where bed or stretcher movement is used. This temporary condition will allow for reasonable infection control protection and maintain an appropriate corridor width.

Cost Impact: This proposal will not increase the cost construction. This change is consistent with existing federal certification requirements.

G200-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G201 – 12
[A] 101.4, [A] 116.5, 201.3, 202, Chapter 34

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Delete without substitution as follows:

~~CHAPTER 34~~
~~EXISTING STRUCTURES~~

Revise as follows:

[A] 101.4 Referenced codes. The other codes listed in Sections 101.4.1 through ~~101.4.6~~ 101.4.7 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

[A] 101.4.7 Existing buildings. The provisions of the *International Existing Building Code* shall apply to all matters governing the repairs, alterations, change of occupancy, additions and relocation of existing buildings.

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

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the *International Energy Conservation Code*, *International Fuel Gas Code*, *International Fire Code*, *International Existing Building Code,* *International Mechanical Code* or *International Plumbing Code,* such terms shall have the meanings ascribed to them as in those codes.

Revise as follows:

SECTION 202
DEFINITIONS

EXISTING STRUCTURE ~~(For Chapter 34)~~. A structure erected prior to the date of adoption of the appropriate code, or one for which a legal building *permit* has been issued.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Consistency and coordination among the International Codes is one of the cornerstones of the ICC Code Development process. The ICC Board established the ICC Building Code Action Committee (BCAC) to act as a forum to deal with complex issues ahead of the Code Development Process, identify emerging issues and draft proposed code changes.

This proposed change is a result of the BCAC's work. This code change proposal was identified as the highest priority of the code change topics brought to the committee.

The purpose of this code change is to eliminate redundant and otherwise unnecessary and confusing requirements in the ICC family of codes. This is an effort to consolidate requirements for Existing Buildings into one code. The IEBC takes a more comprehensive approach to existing buildings than the IBC. The amount of language needed to properly regulate Existing Buildings would make the IBC Chapter 34 too large, or require the IBC to be split into two volumes. Therefore it is necessary and proper to regulate Existing Buildings under the provisions of the IEBC. This does not mean that the IEBC is the only document for regulation of Existing Buildings because the IEBC references the IBC and vice versa.

Some opposition to the deletion of Chapter 34 has been expressed in past code cycles with the reason that most jurisdictions do not adopt the IEBC. Data collected by ICC Government Relations indicates that 75% of all the States have adopted the IEBC locally or statewide. Of those 75%, 60% adopt the IEBC Statewide in some fashion.

Some opposition to the deletion of Chapter 34 has been expressed in past code cycles with the reason that jurisdictions do not want to adopt another book or that it would require burdensome legislative actions. The data collected by ICC Government Relations indicates that the IEBC is adopted in more jurisdictions than the Plumbing Code, yet the International Plumbing Code is referenced throughout the IBC in more sections than the IEBC. This would require jurisdictions to make several legislative actions to amend to those Plumbing Code references in the IBC, whereas they would only have to take one legislative action in the adoption of the IEBC.

The topic of governance of Existing Buildings has gone through several code cycles flip-flopping from being in the IBC, to being in an appendix, to being in a new code - the IEBC. Opposition to removing it from the IBC and putting it in the IEBC has been expressed that the IEBC was "not ready for prime time" while leaving Chapter 34 in the IBC. The text of Chapter 34 is duplicated in Chapter 4 and 14 of the IEBC and is now "ready for prime time"

It is problematic and confusing when attempting to create code changes to address Existing Buildings. The proponent would have to propose amendments to both the IBC and the IEBC. Furthermore a code change in one committee may fail to get approved but approved in the other. Therefore it only makes sense to have the requirements for Existing Buildings in one document, the IEBC. Then all focus and efforts to properly address regulations for Existing Buildings can be handled through one committee, one avenue and one process.

1. This is more of an editorial change, adding the IEBC.
2. There is no need to have the term "for Chapter 34" in the definition. The ICC codes contain language for Terms not defined in current code but are defined in other codes.
3. The IEBC is already referenced for compliance in IBC 3401.6. The IBC committee agreed to place the reference section 3401.6, stating that the IEBC was a viable design tool as a compliance option. The IEBC is one of the several code documents in the ICC Family of Codes. The requirements in Chapter 34 are duplicated in the IEBC in Chapters 4 and 14 as two separate compliance Chapters/Methods the Table below shows the section references between IBC Chapter 34 and IEBC Chapter 4 and 14.
4. This is proposed to be revised and consistent with language in Section 101.4. The IEBC should be a referenced code the same as the IFGC, IMC, IPC, IPMC, IFC and the IECC. The IEBC is referenced in IBC 3401.6.
5. This is more of an editorial change, adding the IEBC.

<u>Comparison Table of the IBC Chapter 34 and the IEBC Chapter 4</u>

IBC 34	IEBC 4	Notes	IBC 34	IEBC 4	Notes	IBC 34	IEBC 4	Notes
3401.1	401.1		3404.5	403.5		3408.3	407.3	
3401.2		Not in IEBC	3404.6	403.6		3408.4	407.4	
3401.3		Found in 301.2	3405.1	404.1		3409.1	408.1	
3401.4	401.2		3405.2	404.2		3409.2	408.2	
3401.5	401.3		3405.3	404.3		3410.1	409.1	
3402		Found in 202	3405.4	404.4		3411.1	410.1	
3403.1	402.1		3405.5	404.5		3411.2	410.2	
3403.2	402.2		3406.1	405.1		3411.3	410.3	
3403.3	402.3		3406.2	405.2		3411.4	410.4	
3403.4	402.4		3406.3	405.3		3411.5	410.5	
3403.5	402.5		3406.4	405.4		3411.6	410.6	
3404.1	403.1		3406.5	405.5		3411.7	410.7	
3404.2	403.2		3407.1	406.1		3411.8	410.8	
3404.3	403.3		3408.1	407.1		3411.9	410.9	
3404.4	403.4		3408.2	407.2		3412	1401	

Notes:
1. 3401.2 of the IBC contains maintenance language. Similar language regarding maintenance is found in the IPMC.
2. 3401.3 of the IBC is not found in IEBC Chapter 4, however it is found in 301.2.
3. 3402 of the IBC is the definition section and is not found in IEBC Chapter 4, however it is found in 202.

Bibliography: ICC Government Relations Code Adoption Resources.

Analysis:
1. This code change proposal will not remove Chapter 4 or Chapter 14 of the IEBC.
2. ICC Staff would have to change the references in Section 1009.7.2 from ~~3404.1~~ to <u>403.1 of the International Existing Building Code</u>
3. ICC Staff would have to change the references in Section 1103.2.2 from ~~3411~~ <u>410 of the International Existing Building Code</u>

Cost Impact: The code change proposal will not increase the cost of construction.

Staff note: The IEBC does not have a definition for 'existing structure', however, it does have a definition for 'existing building' that reads as follows: [B] EXISTING BUILDING. A building erected prior to the date of the adoption of the appropriate code, or one for which a legal building permit has been issued.

G201-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

CH 34-G-BAJNAI-BCAC.doc

G202 – 12
202, Chapter 34

Proponent: Maureen Traxler, City of Seattle Dept. of Planning & Development, representing Washington Association of Building Officials Technical Code Development (maureen.traxler@seattle.gov)

Add new definitions as follows:

<u>**CHANGE OF OCCUPANCY.** A change in the purpose or level of activity within a building that involves a change in application of the requirements of this code.</u>

<u>**WORK AREA.** That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.</u>

Revise as follows:

CHAPTER 34
EXISTING STRUCTURES

<u>**Part I—Scope, Application and Definitions**</u>

SECTION 3401 (IEBC [B] CHAPTER 4)
GENERAL

3401.1 (IEBC [B] 401.1) Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and change of occupancy of existing buildings and structures.

> **Exception:** Existing *bleachers*, grandstands and folding and telescopic seating shall comply with ICC 300.

3401.2 Maintenance. Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this subsection, the *building official* shall have the authority to require a building or structure to be reinspected. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures.

3401.3 Compliance <u>with other codes</u>. *Alterations*, *repairs*, *additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in the *International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code, International Residential Code* and NFPA 70. Where provisions of the other codes conflict with provisions of this Chapter, the provisions of this Chapter shall take precedence.

3401.4 (IEBC [B] 401.2) Building materials and systems. Building materials and systems shall comply with the requirements of this section.

3401.4.1 (IEBC [B] 401.2.1) Existing materials. Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the *building official* to be unsafe per Section 116.

3401.4.2 (IEBC [B] 401.2.2) New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not *permit* their use in buildings of similar occupancy, purpose and location.

3401.4.3 (IEBC [B] 401.2.3) Existing seismic force-resisting systems. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω0, and Cd for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

3401.5 (IEBC [B] 401.3) Dangerous conditions. The *building official* shall have the authority to require the elimination of conditions deemed *dangerous*.

~~**3401.6 Alternative compliance.** Work performed in accordance with the *International Existing Building Code* shall be deemed to comply with the provisions of this chapter.~~

3401.6 (IEBC 301.1) Compliance methods. The *repair*, *alteration*, *change of occupancy*, *addition* or relocation of all *existing buildings* shall comply with one of the methods listed in Sections 3401.6.1 through 3401.6.3 as selected by the applicant. Application of a method shall be the sole basis for assessing the compliance of work performed under a single permit unless otherwise approved by the *building official*. Sections 3401.6.1 through 3401.6.3 shall not be applied in combination with each other. Where this code requires consideration of the seismic force-resisting system of an *existing building* subject to *repair*, *alteration*, *change of occupancy*, *addition* or relocation of *existing buildings*, the seismic evaluation and design shall be based on Section 3401.6.4 regardless of which compliance method is used.

> **Exception:** Subject to the approval of the *building official*, *alterations* complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural *alteration* as defined in Section 3417.12.3.3. New structural members added as part of the *alteration* shall comply with this code. *Alteration*s of *existing buildings* in *flood hazard areas* shall comply with Section 3415.3.

3401.6.1 (IEBC 301.1.1) Prescriptive compliance method. *Repairs*, *alterations*, *additions* and *changes of occupancy* complying with Sections 3403 through 3411 of this code in buildings complying with the *International Fire Code* shall be considered in compliance with the provisions of this code.

3401.6.2 (IEBC 301.1.2) Performance compliance method. *Repairs*, *alterations*, *additions*, changes in occupancy and relocated buildings complying with Section 3412 of this code shall be considered in compliance with the provisions of this code.

3401.6.3 (IEBC 301.1.3) Work area compliance method. *Repairs*, *alterations*, *additions*, changes in occupancy and relocated buildings complying with the applicable requirements of Sections 3413 through 3421 shall be considered in compliance with the provisions of this code.

3401.6.4 (IEBC 301.1.4) Seismic evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in Chapter 16, ASCE 31 or ASCE 41. The procedures contained in Appendix A of the *International Existing Building Code* shall be permitted to be used as specified in Section 3401.6.4.2.

3401.6.4.1 (IEBC 301.1.4.1) Compliance with Chapter 16 level seismic forces. Where compliance with the seismic design provisions of Chapter 16 is required, the procedures shall be in accordance with one of the following:

1. One-hundred percent of the values in Chapter 16. Where the existing seismic force-resisting system is a type that can be designated as "Ordinary," values of *R*, Ω*0* and *Cd* used for analysis in accordance with Chapter 16 shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system will provide performance equivalent to that of a "Detailed," "Intermediate" or "Special" system.
2. Compliance with ASCE 41 using both the BSE-1 and BSE-2 earthquake hazard levels and the corresponding performance levels shown in Table 3401.6.4.1.

TABLE 3401.6.4.1 (IEBC TABLE 301.1.4.1)
PERFORMANCE CRITERIA FOR CHAPTER 16-LEVEL SEISMIC FORCES OCCUPANCY

RISK CATEGORY (Based on IBC Table 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Collapse prevention (CP)
II	Life safety (LS)	Collapse prevention (CP)
III	Note a	Note a
IV	Immediate occupancy (IO)	Life safety (LS)

a. Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance levels, but need not be less than the acceptance criteria specified for Risk Category IV performance levels.

3401.6.4.2 (IEBC 301.1.4.2) Compliance with reduced Chapter 16 level seismic forces. Where seismic evaluation and design is permitted to meet reduced Chapter 16 seismic force levels, the procedures used shall be in accordance with one of the following:

1. Chapter 16 using 75 percent of the prescribed forces. Values of *R*, Ω*0* and *Cd* used for analysis shall be as specified in Section 3401.6.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A of the *International Existing Building Code* as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix A Chapters shall be deemed to comply with this section.

2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.

2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.

2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.

2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.

2.5. Seismic evaluation and design of concrete buildings in all risk categories are permitted to be based on the procedures specified in Chapter A5.

3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 3401.6.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 3401.6.4.2. The design spectral response acceleration parameters *SXS* and *SX1* specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters *SDS* and *SD1* defined by Chapter 16.

TABLE 3401.6.4.2 (IEBC TABLE 301.1.4.2)
PERFORMANCE CRITERIA FOR REDUCED CHAPTER 16-LEVEL SEISMIC FORCES OCCUPANCY

RISK CATEGORY (Based on IBC Table 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 31	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Life safety (LS)
II	Life safety (LS)	Life safety (LS)
III	Notes a, b	Note a
IV	Immediate occupancy (IO)	Life safety (LS)

a. Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance levels, but need not be less than the acceptance criteria specified for Risk Category IV levels.
b. For Risk Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.

Part II—Prescriptive Compliance Method

SECTION 3403
ADDITIONS

(No change to Sections 3403 through 3411)

Part III—Performance Compliance Method

SECTION 3412
PERFORMANCE COMPLIANCE METHOD ~~ALTERNATIVES~~

(No changes to Section 3412)

Part IV—Work Area Compliance Method

SECTION 3413 (IEBC CHAPTER 5)
CLASSIFICATION OF WORK

3413.1 General. *Alterations*, *repairs*, *additions* and *changes of occupancy* to existing structures using the work area method shall comply with the provisions of Section 3414 through 3421. The work performed on an *existing building* shall be classified in accordance with this section.

3413.2 (IEBC 501.2) Work area. The *work area* shall be identified on the construction documents.

3413.3 (IEBC 502.1) Repairs. *Repairs* include the patching or restoration or replacement of damaged materials, elements, *equipment or fixtures* for the purpose of maintaining such components in good or sound condition with respect to existing loads or performance requirements.

3413.3.2 (IEBC 502.2) Application. *Repairs* shall comply with the provisions of Section 3414.

3413.3.3 (IEBC 502.3) Related work. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered part of the *repair* and shall not be subject to the provisions of Sections 3415, 3416, 3417, 3418 or 3419.

3413.4 (IEBC 503.1) Level 1 alterations. Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.

3413.4.1 (IEBC 503.2) Application. Level 1 *alterations* shall comply with the provisions of Section 3415.

3413.5 (IEBC 504.1) Level 2 alterations. Level 2 *alterations* include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.

3413.5.1 (IEBC 504.2) Application. Level 2 *alterations* shall comply with the provisions of Section 3415 for Level 1 *alterations* as well as the provisions of Section 3416.

3413.6 (IEBC 505.1) Level 3 alterations. Level 3 *alterations* apply where the *work area* exceeds 50 percent of the aggregate area of the building.

3413.6.1 (IEBC 505.2) Application. Level 3 *alterations* shall comply with the provisions of Sections 3415 and 3416 for Level 1 and 2 *alterations*, respectively, as well as the provisions of Section 3417.

3413.7 (IEBC 506.1) Change of occupancy. *Change of occupancy* provisions apply where the activity is classified as a *change of occupancy*.

3413.7.1 (IEBC 506.2) Application. *Changes of occupancy* shall comply with the provisions of Section 3418.

3413.8 (IEBC 507.1) Additions. Provisions for *additions* shall apply where work is classified as an *addition*.

3413.8.1 (IEBC 507.2) Application. *Additions* to *existing buildings* shall comply with the provisions of Section 3419.

3413.9 (IEBC 508.1) Historic buildings. *Historic building* provisions shall apply to buildings classified as historic buildings.

3413.9.1 (IEBC 508.2) Application. Except as specifically provided for in Section 3420, *historic buildings* shall comply with applicable provisions of this code for the type of work being performed.

3413.10 (IEBC 509.1) Relocated buildings. Relocated building provisions shall apply to relocated or moved buildings.

3413.10.1 (IEBC 509.2) Application. Relocated buildings shall comply with the provisions of Section 3421.

SECTION 3414 (IEBC CHAPTER 6)
REPAIRS

3414.1 (IEBC 601.1) Scope. Repairs as described in Section 3413.3 shall comply with the requirements of this section. Repairs to *historic buildings* need only comply with Section 3420.

3414.2 (IEBC 601.2) Conformance. The work shall not make the building less conforming than it was before the *repair* was undertaken.

3414.3 (IEBC [B] 601.3) Flood hazard areas. In flood hazard areas, repairs that constitute *substantial improvement* shall require that the building comply with Section 1612.

3414.4 (IEBC 602.1) Existing building materials. Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the *building official* to render the building or structure unsafe or *dangerous*.

3414.5 (IEBC 602.2) New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for *repairs* and *alterations*, provided no *dangerous* or *unsafe* condition is created. Hazardous materials, such as asbestos and lead-based paint, shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

3414.6 (IEBC 602.3) Glazing in hazardous locations. Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24.

Exception: Glass block walls, louvered windows, and jalousies repaired with like materials.

3414.7 (IEBC 603.1) Fire protection. Repairs shall be done in a manner that maintains the level of fire protection provided.

3414.8 (IEBC 604.1) Means of egress. Repairs shall be done in a manner that maintains the level of protection provided for the means of egress.

3414.9 (IEBC 605.1) Accessibility. Repairs shall be done in a manner that maintains the level of accessibility provided.

3414.10 (IEBC [B] 606.1) Structural repairs. Structural repairs shall be in compliance with this section and shall not make the building less conforming than it was before the *repair* was undertaken. Regardless of the extent of structural or nonstructural damage, *dangerous* conditions shall be eliminated. Regardless of the scope of *repair*, new structural members and connections used for *repair* or *rehabilitation* shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3414.10.1 (IEBC [B] 606.2.1) Repairs for less than substantial structural damage. For damage less than *substantial structural damage*, the damaged elements shall be permitted to be restored to their predamage condition.

3414.10.2 (IEBC [B] 606.2.2) Substantial structural damage to vertical elements of the lateral force-resisting system. A building that has sustained *substantial structural damage* to the vertical elements of its lateral force-resisting system shall be evaluated in accordance with Section 3414.10.2.1, and either repaired in accordance with Section 3414.10.2.2 or repaired and rehabilitated in accordance with Section 3414.10.2.3, depending on the results of the evaluation.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

3414.10.2.1 (IEBC [B] 606.2.2.1) Evaluation. The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the *building official*. The evaluation shall establish whether the damaged building, if repaired to its predamage state, would comply with the provisions of this code for load combinations that include wind or earthquake effects, except that the seismic forces shall be the reduced Chapter 16-level seismic forces.

3414.10.2.2 (IEBC [B] 606.2.2.2) Extent of repair for compliant buildings. If the evaluation establishes that the building in its predamage condition complies with the provisions of Section 3414.10.2.1, then the damaged elements shall be permitted to be restored to their predamage condition.

3414.10.2.3 (IEBC [B] 606.2.3) Extent of repair for noncompliant buildings. If the evaluation does not establish that the building in its predamage condition complies with the provisions of Section 3414.10.2.1, then the building shall be rehabilitated to comply with the provisions of this section. The wind loads for the *repair* and *rehabilitation* shall be those required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be in accordance with this code. The seismic loads for this *rehabilitation* design shall be those required by the building code in effect at the time of original construction, but not less than the reduced Chapter 16-level seismic forces.

3414.10.3 (IEBC [B] 606.2.3) Substantial structural damage to gravity load-carrying components. Gravity load-carrying components that have sustained *substantial structural damage* shall be rehabilitated to comply with the applicable provisions for dead and live loads in this code. Snow loads shall be considered if the *substantial structural damage* was caused by or related to snow load effects. Undamaged gravity load-carrying components that receive dead, live or snow loads from rehabilitated components shall also be rehabilitated if required to comply with the design loads of the *rehabilitation* design.

3414.10.3.1 (IEBC [B] 606.2.3.1) Lateral force-resisting elements. Regardless of the level of damage to gravity elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section 3414.10.2.1 and, if noncompliant, rehabilitated in accordance with Section 3414.10.2.3.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

3414.10.4 (IEBC [B] 606.2.4) Flood hazard areas. In *flood hazard areas*, buildings that have sustained *substantial damage* shall be brought into compliance with Section 1612.

SECTION 3415 (IEBC CHAPTER 7)
LEVEL 1 ALTERATIONS

3415.1 (IEBC 701.1) Scope. Level 1 *alterations* as described in Section 3413.4 shall comply with the requirements of this section. Level 1 *alterations* to *historic buildings* shall comply with this section, except as modified in Section 3420.

3415.2 (IEBC 701.2) Conformance. An *existing building* or portion thereof shall not be altered such that the building becomes less safe than its existing condition.

Exception: Where the current level of safety or sanitation is proposed to be reduced, the portion altered shall conform to the requirements of this code.

3415.3 (IEBC [B] 701.3) Flood hazard areas. In *flood hazard areas*, *alterations* that constitute *substantial improvement* shall require that the building comply with Section 1612.

3415.4 (IEBC 702.1) Interior finishes. All newly installed interior wall and ceiling finishes shall comply with Chapter 8.

3415.5 (IEBC 702.4) Materials and methods. All new work shall comply with the materials and methods requirements in this code that specify material standards, detail of installation and connection, joints, penetrations, and continuity of any element, component, or system in the building.

3415.6 (IEBC 703.1) Fire protection. *Alterations* shall be done in a manner that maintains the level of fire protection provided.

3415.7 (IEBC 704.1) Means of egress. *Alterations* shall be done in a manner that maintains the level of protection provided for the means of egress.

3415.8 (IEBC 705.1) Accessibility. A *facility* that is altered shall comply with the applicable provisions in Sections 3415.8.1 through 3418.14 and Chapter 11 unless it is *technically infeasible*. Where compliance with this section is *technically infeasible*, the alteration shall provide access to the maximum extent that is technically feasible. A *facility* that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 3418.15.
2. Accessible means of egress are not required to be provided in existing *facilities*.
3. Type B dwelling or sleeping units required by Section 1107 are not required to be provided in existing *facilities* undergoing less than a Level 3 *alteration*.
4. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units.

3415.8.1 (IEBC 705.1.1) Entrances. Where an *alteration* includes alterations to an entrance, and the *facility* has an accessible entrance on an accessible route, the altered entrance is not required to be accessible unless required by Section 3415.8.15. Signs complying with Section 1110 shall be provided.

3415.8.2 (IEBC 705.1.2) Elevators. Altered elements of existing elevators shall comply with ASME A17.1/CSA B44 and ICC A117.1. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator.

3415.8.3 (IEBC 705.1.3) Platform lifts. Platform (wheelchair) lifts complying with ICC A117.1 and installed in accordance with ASME A18.1 shall be permitted as a component of an accessible route.

3415.8.4 (IEBC 705.1.4) Ramps. Where steeper slopes than allowed by Section 1010.3 are necessitated by space limitations, the slope of ramps in or providing access to existing facilities shall comply with Table 3415.8.4.

TABLE 3415.8.4 (IEBC TABLE 705.1.4)
RAMPS

SLOPE	MAXIMUM RISE
Steeper than 1:10 but not steeper than 1:8	3 inches
Steeper than 1:12 but not steeper than 1:10	6 inches

For SI: 1 inch = 25.4 mm.

3415.8.5 (IEBC 705.1.5) Dining areas. An accessible route to raised or sunken dining areas or to outdoor seating areas is not required provided that the same services and decor are provided in an accessible space usable by any occupant and not restricted to use by people with a disability.

3415.8.6 (IEBC 705.1.6) Performance areas. Where it is *technically infeasible* to alter performance areas to be on an accessible route, at least one of each type of performance area shall be made accessible.

3415.8.7 (IEBC 705.1.7) Jury boxes and witness stands. In *alterations*, accessible wheelchair spaces are not required to be located within the defined area of raised jury boxes or witness stands and shall be permitted to be located outside these spaces where ramp or lift access poses a hazard by restricting or projecting into a required means of egress.

3415.8.8 (IEBC 705.1.8) Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered, the requirements of Section 1107 for accessible units and Chapter 9 for visible alarms apply only to the quantity of the spaces being altered.

3415.8.9 (IEBC 705.1.9) Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being altered, the requirements of Section 1107 for Type A units and Chapter 9 for visible alarms apply only to the quantity of the spaces being altered.

3415.8.10 (IEBC 705.1.10) Toilet rooms. Where it is technically infeasible to alter existing toilet and bathing rooms to be accessible, an accessible family or assisted-use toilet or bathing room constructed in accordance with Section 1109.2.1 is permitted. The family or assisted-use toilet or bathing room shall be located on the same floor and in the same area as the existing toilet or bathing rooms.

3415.8.11 (IEBC 705.1.11) Dressing, fitting and locker rooms. Where it is *technically infeasible* to provide accessible dressing, fitting, or locker rooms at the same location as similar types of rooms, one accessible room on the same level shall be provided. Where separate sex facilities are provided, accessible rooms for each sex shall be provided. Separate sex facilities are not required where only unisex rooms are provided.

3415.8.12 (IEBC 705.1.12) Fuel dispensers. Operable parts of replacement fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

3415.8.13 (IEBC 705.1.13) Thresholds. The maximum height of thresholds at doorways shall be 3/4 inch (19.1 mm). Such thresholds shall have beveled edges on each side.

3415.8.14 (IEBC 705.1.14) Extent of application. An *alteration* of an existing element, space, or area of a *facility* shall not impose a requirement for greater accessibility than that which would be required for new construction. *Alterations* shall not reduce or have the effect of reducing accessibility of a *facility* or portion of a *facility*.

3415.8.15 (IEBC 705.2) Alterations affecting an area containing a primary function. Where an *alteration* affects the accessibility to a, or contains an area of, *primary function*, the route to the *primary function* area shall be accessible. The accessible route to the *primary function* area shall include toilet facilities or drinking fountains serving the area of *primary function*.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of *primary function*.
2. This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to *alterations* limited solely to mechanical systems, electrical systems, installation or *alteration* of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to *alterations* undertaken for the primary purpose of increasing the accessibility of a *facility*.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

3415.9 (IEBC [B] 706.1) Structural. Where *alteration* work includes replacement of equipment that is supported by the building or where a reroofing permit is required, the provisions of this section shall apply.

3415.9.1 (IEBC [B] 706.2) Addition or replacement of roofing or replacement of equipment. Where addition or replacement of roofing or replacement of equipment results in additional dead loads, structural components supporting such reroofing or equipment shall comply with the gravity load requirements of this code.

Exceptions:

1. Structural elements where the additional dead load from the roofing or equipment does not increase the force in the element by more than 5 percent.
2. Buildings constructed in accordance with the conventional light-frame construction methods of this code and where the dead load from the roofing or equipment is not increased by more than 5 percent.
3. Addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m^2) or less over an existing, single layer of roof covering.

3415.9.2(IEBC [B] 706.3) Additional requirements for reroof permits. The requirements of this section shall apply to *alteration* work requiring reroof permits.

3415.9.2.1 (IEBC [B] 706.3.1) Bracing for unreinforced masonry bearing wall parapets. Where a permit is issued for reroofing for more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing to resist the reduced Chapter 16-level seismic forces as specified in Section 3401.6.4.2, unless an evaluation demonstrates compliance of such items.

3415.9.2.2 (IEBC [B] 706.3.2) Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the basic wind speed is greater than 90 mph or in a special wind region, as defined in Section 1609, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in this code, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in this code.

SECTION 3416 (IEBC CHAPTER 8)
LEVEL 2 ALTERATIONS

3416.1 (IEBC 801.1) Scope. Level 2 *alterations* as described in Section 3413.5 shall comply with the requirements of this section.

Exception: Buildings in which the reconfiguration is exclusively the result of compliance with the accessibility requirements of Section 3415.8.15 shall be permitted to comply with Section 3415.

3416.2 (IEBC 801.2) Alteration Level 1 compliance. In addition to the requirements of this section, all work shall comply with the requirements of Section 3415.

3416.3 (IEBC 801.3) Compliance. All new construction elements, components, systems, and spaces shall comply with the requirements of this code.

Exceptions:

1. Windows may be added without requiring compliance with the light and ventilation requirements of this code.
2. The length of dead-end corridors in newly constructed spaces shall only be required to comply with the provisions of Section 3416.7.5.
3. The minimum ceiling height of the newly created habitable and occupiable spaces and corridors shall be 7 feet (2134 mm).

3416.4 (IEBC 802.1) Special use and occupancy. *Alteration* of buildings classified as special use and occupancy as described in Chapter 4 shall comply with the requirements of Section 3416.1.

3416.5 (IEBC 803.1) Building elements and materials. The requirements of this section are limited to work areas in which Level 2 *alterations* are being performed, and shall apply beyond the *work area* where specified.

3416.5.1 (IEBC 803.2) Vertical openings. Existing vertical openings shall comply with the provisions of Sections 3416.5.1.1, 3416.5.1.2 and 3416.5.1.3.

3416.5.1.1 (IEBC 803.2.1) Existing vertical openings. All existing interior vertical openings connecting two or more floors shall be enclosed with approved assemblies having a fire-resistance rating of not less than 1 hour with approved opening protectives.

Exceptions:

1. Where vertical opening enclosure is not required by this code or the *International Fire Code*.
2. Interior vertical openings other than stairways may be blocked at the floor and ceiling of the *work area* by installation of not less than 2 inches (51 mm) of solid wood or equivalent construction.
3. The enclosure shall not be required where:
   - 3.1. Connecting the main floor and mezzanines; or
   - 3.2. All of the following conditions are met:
     - 3.2.1. The communicating area has a low hazard occupancy or has a moderate hazard occupancy that is protected throughout by an automatic sprinkler system.
     - 3.2.2. The lowest or next to the lowest level is a street floor.
     - 3.2.3. The entire area is open and unobstructed in a manner such that it may be assumed that a fire in any part of the interconnected spaces will be readily obvious to all of the occupants.
     - 3.2.4. Exit capacity is sufficient to provide egress simultaneously for all occupants of all levels by considering all areas to be a single floor area for the determination of required exit capacity.
     - 3.2.5. Each floor level, considered separately, has at least one-half of its individual required exit capacity provided by an exit or exits leading directly out of that level without having to traverse another communicating floor level or be exposed to the smoke or fire spreading from another communicating floor level.
4. In Group A occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories.
5. In Group B occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 3416.5.1.1, shall not be required in the following locations:
   - 5.1. Buildings not exceeding 3,000 square feet (279 m^2) per floor.
   - 5.2. Buildings protected throughout by an approved automatic fire sprinkler system.
6. In Group E occupancies, the enclosure shall not be required for vertical openings not exceeding three stories when the building is protected throughout by an approved automatic fire sprinkler system.
7. In Group F occupancies, the enclosure shall not be required in the following locations:
   - 7.1. Vertical openings not exceeding three stories.
   - 7.2. Special purpose occupancies where necessary for manufacturing operations and direct access is provided to at least one protected stairway.
   - 7.3. Buildings protected throughout by an approved automatic sprinkler system.
8. In Group H occupancies, the enclosure shall not be required for vertical openings not exceeding three stories where necessary for manufacturing operations and every floor level has direct access to at least two remote enclosed stairways or other approved exits.

9. In Group M occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 3416.5.1.1, shall not be required in the following locations:
    9.1. Openings connecting only two floor levels.
    9.2. Occupancies protected throughout by an approved automatic sprinkler system.
10. In Group R-1 occupancies, the enclosure shall not be required for vertical openings not exceeding three stories in the following locations:
    10.1. Buildings protected throughout by an approved automatic sprinkler system.
    10.2. Buildings with less than 25 dwelling units or sleeping units where every sleeping room above the second floor is provided with direct access to a fire escape or other approved second exit by means of an approved exterior door or window having a sill height of not greater than 44 inches (1118 mm) and where:
        10.2.1. Any exit access corridor exceeding 8 feet (2438 mm) in length that serves two means of egress, one of which is an unprotected vertical opening, shall have at least one of the means of egress separated from the vertical opening by a 1-hour fire barrier; and
        10.2.2. The building is protected throughout by an automatic fire alarm system, installed and supervised in accordance with Chapter 9.
11. In Group R-2 occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 3416.5.1.1, shall not be required in the following locations:
    11.1. Vertical openings not exceeding two stories with not more than four dwelling units per floor.
    11.2. Buildings protected throughout by an approved automatic sprinkler system.
    11.3. Buildings with not more than four dwelling units per floor where every sleeping room above the second floor is provided with direct access to a fire escape or other approved second exit by means of an approved exterior door or window having a sill height of not greater than 44 inches (1118 mm) and the building is protected throughout by an automatic fire alarm system complying with Section 3416.6.4.
12. One- and two-family dwellings.
13. Group S occupancies where connecting not more than two floor levels or where connecting not more than three floor levels and the structure is equipped throughout with an approved automatic sprinkler system.
14. Group S occupancies where vertical opening protection is not required for open parking garages and ramps.

3416.5.1.2 (IEBC 803.2.2) Supplemental shaft and floor opening enclosure requirements. Where the *work area* on any floor exceeds 50 percent of that floor area, the enclosure requirements of Section 3416.5.1 shall apply to vertical openings other than stairways throughout the floor.

Exception: Vertical openings located in tenant spaces that are entirely outside the *work area*.

3416.5.1.3 (IEBC 803.2.3) Supplemental stairway enclosure requirements. Where the *work area* on any floor exceeds 50 percent of that floor area, stairways that are part of the means of egress serving the *work area* shall, at a minimum, be enclosed with smoke-tight construction on the highest *work area* floor and all floors below.

Exception: Where stairway enclosure is not required by this code or the *International Fire Code*.

3416.5.2 (IEBC 803.3) Smoke barriers. Smoke barriers in Group I-2 occupancies shall be installed where required by Sections 3416.5.2.1 and 3416.5.2.2.

3416.5.2.1 (IEBC 803.3.1) Compartmentation. Where the w*ork area* is on a story used for sleeping rooms for more than 30 patients, the story shall be divided into not less than two compartments by smoke barrier walls complying with Section 3416.5.2.2 such that each compartment does not exceed 22,500 square feet (2093 m2), and the travel distance from any point to reach a door in the required smoke barrier shall not exceed 200 feet (60 960 mm).

Exception: Where neither the length nor the width of the smoke compartment exceeds 150 feet (45 720 mm), the travel distance to reach the smoke barrier door shall not be limited.

3416.5.2.2 (IEBC 803.3.2) Fire-resistance rating. The smoke barriers shall be fire-resistance rated for 30 minutes and constructed in accordance with Section 709.

3416.5.3 (IEBC 803.4) Interior finish. The interior finish of walls and ceilings in exits and corridors in any *work area* shall comply with the requirements of Chapter 8.

Exception: Existing interior finish materials that do not comply with the interior finish requirements of Chapter 8 shall be permitted to be treated with an approved fire-retardant coating in accordance with the manufacturer's instructions to achieve the required rating.

3416.5.3.1 (IEBC 803.4.1) Supplemental interior finish requirements. Where the *work area* on any floor exceeds 50 percent of the floor area, Section 3416.5.3 shall also apply to the interior finish in exits and corridors serving the *work area* throughout the floor.

Exception: Interior finish within tenant spaces that are entirely outside the *work area*.

3416.5.4 (IEBC 803.5) Guards. The requirements of Sections 3416.5.4.1 and 3416.5.4.2 shall apply in all *work areas*.

3416.5.4.1 (IEBC 803.5.1) Minimum requirement. Every portion of a floor, such as a balcony or a loading dock, that is more than 30 inches (762 mm) above the floor or grade below and is not provided with guards, or those in which the existing guards are judged to be in danger of collapsing, shall be provided with guards.

3416.5.4.2 (IEBC 803.5.2) Design. Where there are no guards or where existing guards must be replaced, the guards shall be designed and installed in accordance with this code.

3416.6 (IEBC 804.1) Fire protection. The requirements of this section shall be limited to work areas in which Level 2 *alterations* are being performed, and where specified they shall apply throughout the floor on which the *work areas* are located or otherwise beyond the *work area*.

3416.6.1 (IEBC 804.1.1) Corridor ratings. Where an approved automatic sprinkler system is installed throughout the story, the required fire-resistance rating for any corridor located on the story shall be permitted to be reduced in accordance with this code. In order to be considered for a corridor rating reduction, such system shall provide coverage for the stairwell landings serving the floor and the intermediate landings immediately below.

3416.6.2 (IEBC 804.2) Automatic sprinkler systems. Automatic sprinkler systems shall be provided in accordance with the requirements of Sections 3416.6.2.1 through 3416.6.2.5. Installation requirements shall be in accordance with Chapter 9.

3416.6.2.1 (IEBC 804.2.1) High-rise buildings. In high-rise buildings, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection in the entire *work area* where the *work area* is located on a floor that has a sufficient sprinkler water supply system from an existing standpipe or a sprinkler riser serving that floor.

3416.6.2.1.1 (IEBC 804.2.1.1) Supplemental automatic sprinkler system requirements. Where the *work area* on any floor exceeds 50 percent of that floor area, Section 3416.6.2.1 shall apply to the entire floor on which the *work area* is located.

Exception: Tenant spaces that are entirely outside the *work area*.

3416.6.2.2 (IEBC 804.2.2) Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1 and S-2. In buildings with occupancies in Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1 and S-2, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection where all of the following conditions occur:

1. The *work area* is required to be provided with automatic sprinkler protection in accordance with Chapter 9 as applicable to new construction; and
2. The *work area* exceeds 50 percent of the floor area.

Exceptions:

1. Work areas in Group R occupancies three stories or less in height.
2. If the building does not have sufficient municipal water supply for design of a fire sprinkler system available to the floor without installation of a new fire pump, work areas shall be protected by an automatic smoke detection system throughout all occupiable spaces other than sleeping units or individual dwelling units that activates the occupant notification system in accordance with Sections 907.4, 907.5 and 907.6.

3416.6.2.2.1 (IEBC 804.2.2.1) Mixed uses. In work areas containing mixed uses, one or more of which requires automatic sprinkler protection in accordance with Section 3416.6.2.2, such protection shall not be required throughout the *work area* provided that the uses requiring such protection are separated from those not requiring protection by fire-resistance-rated construction having a minimum 2-hour rating for Group H and a minimum 1-hour rating for all other occupancy groups.

3416.6.2.3 (IEBC 804.2.3) Windowless stories. Work located in a story without windows, as determined in accordance with Section 903.2.11.1, shall be sprinklered where the *work area* is required to be sprinklered under the provisions of this code for newly constructed buildings and the building has a sufficient municipal water supply without installation of a new fire pump.

3416.6.2.4 (IEBC 804.2.4) Other required automatic sprinkler systems. In buildings and areas listed in Table 903.2.11.6, *work areas* that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with an automatic sprinkler system under the following conditions:

1. The *work area* is required to be provided with an automatic sprinkler system in accordance with this code applicable to new construction; and
2. The building has sufficient municipal water supply for design of an automatic sprinkler system available to the floor without installation of a new fire pump.

3416.6.2.5 (IEBC 804.2.5) Supervision. Fire sprinkler systems required by this section shall be supervised by one of the following methods:

1. Approved central station system in accordance with NFPA 72;
2. Approved proprietary system in accordance with NFPA 72;
3. Approved remote station system of the jurisdiction in accordance with NFPA 72; or
4. When approved by the *building official*, approved local alarm service that will cause the sounding of an alarm in accordance with NFPA 72.

Exception: Supervision is not required for the following:

1. Underground gate valve with roadway boxes.
2. Halogenated extinguishing systems.
3. Carbon dioxide extinguishing systems.

4. Dry- and wet-chemical extinguishing systems.
5. Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic and automatic sprinkler systems and a separate shutoff valve for the automatic sprinkler system is not provided.

3416.6.3 (IEBC 804.3) Standpipes. Where the *work area* includes exits or corridors shared by more than one tenant and is located more than 50 feet (15 240 mm) above or below the lowest level of fire department access, a standpipe system shall be provided. Standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access. Standpipe systems shall be installed in accordance with Chapter 9.

Exceptions:

1. No pump shall be required provided that the standpipes are capable of accepting delivery by fire department apparatus of a minimum of 250 gallons per minute (gpm) at 65 pounds per square inch (psi) (946 L/m at 448KPa) to the topmost floor in buildings equipped throughout with an automatic sprinkler system or a minimum of 500 gpm at 65 psi (1892 L/m at 448KPa) to the topmost floor in all other buildings. Where the standpipe terminates below the topmost floor, the standpipe shall be designed to meet (gpm/psi) (L/m/KPa) requirements of this exception for possible future extension of the standpipe.
2. The interconnection of multiple standpipe risers shall not be required.

3416.6.4 (IEBC 804.4) Fire alarm and detection. An approved fire alarm system shall be installed in accordance with Sections 3416.6.4.1 through 3416.6.4.3. Where automatic sprinkler protection is provided in accordance with Section 3416.6.2 and is connected to the building fire alarm system, automatic heat detection shall not be required.

An approved automatic fire detection system shall be installed in accordance with the provisions of this code and NFPA 72. Devices, combinations of devices, appliances, and equipment shall be approved. The automatic fire detectors shall be smoke detectors, except that an approved alternative type of detector shall be installed in spaces such as boiler rooms, where products of combustion are present during normal operation in sufficient quantity to actuate a smoke detector.

3416.6.4.1 (IEBC 804.4.1) Occupancy requirements. A fire alarm system shall be installed in accordance with Sections 3416.6.4.1.1 through 3416.6.4.1.7. Existing alarm-notification appliances shall be automatically activated throughout the building. Where the building is not equipped with a fire alarm system, alarm-notification appliances within the *work area* shall be provided and automatically activated.

Exceptions:

1. Occupancies with an existing, previously approved fire alarm system.
2. Where selective notification is permitted, alarm notification appliances shall be automatically activated in the areas selected.

3416.6.4.1.1 (IEBC 804.4.1.1) Group E. A fire alarm system shall be installed in *work areas* of Group E occupancies as required by Chapter 9 for existing Group E occupancies.

3416.6.4.1.2 (IEBC 804.4.1.2) Group I-1. A fire alarm system shall be installed in *work areas* of Group I-1 residential care/assisted living facilities as required by Chapter 9 for existing Group I-1 occupancies.

3416.6.4.1.3 (IEBC 804.4.1.3) Group I-2. A fire alarm system shall be installed in *work areas* of Group I-2 occupancies as required by Chapter 9 for existing Group I-2 occupancies.

3416.6.4.1.4 (IEBC 804.4.1.4) Group I-3. A fire alarm system shall be installed in *work areas* of Group I-3 occupancies as required by Chapter 9 for existing Group I-3 occupancies.

3416.6.4.1.5 (IEBC 804.4.1.5) Group R-1. A fire alarm system shall be installed in Group R-1 occupancies as required by Chapter 9 for existing Group R-1 occupancies.

3416.6.4.1.6 (IEBC 804.4.1.6) Group R-2. A fire alarm system shall be installed in *work areas* of Group R-2 apartment buildings as required by Chapter 9 for existing Group R-2 occupancies.

3416.6.4.1.7 (IEBC 804.4.1.7) Group R-4. A fire alarm system shall be installed in *work areas* of Group R-4 residential care/assisted living facilities as required by Chapter 9 for existing Group R-4 occupancies.

3416.6.4.2 (IEBC 804.4.2) Supplemental fire alarm system requirements. Where the *work area* on any floor exceeds 50 percent of that floor area, Section 3416.6.4.1 shall apply throughout the floor.

Exception: Alarm-initiating and notification appliances shall not be required to be installed in tenant spaces outside of the *work area*.

3416.6.4.3 (IEBC 804.4.3) Smoke alarms. Individual sleeping units and individual dwelling units in any *work area* in Group R and I-1 occupancies shall be provided with smoke alarms in accordance with Chapter 9.

Exception: Interconnection of smoke alarms outside of the *work area* shall not be required.

3416.7 (IEBC 805.1) Means of egress. The requirements of this section shall be limited to work areas that include exits or corridors shared by more than one tenant within the *work area* in which Level 2 *alterations* are being performed, and where specified they shall apply throughout the floor on which the *work areas* are located or otherwise beyond the *work area*.

3416.7.1 (IEBC 805.2) General. The means of egress shall comply with the requirements of this section.

Exceptions:

1. Where the *work area* and the means of egress serving it complies with NFPA 101.
2. Means of egress conforming to the requirements of the building code under which the building was constructed shall be considered compliant means of egress if, in the opinion of the *building official*, they do not constitute a distinct hazard to life.

3416.7.2 (IEBC 805.3) Number of exits. The number of exits shall be in accordance with Sections 3416.7.2.1 through 3416.7.2.5.

3416.7.2.1 (IEBC 805.3.1) Minimum number. Every story utilized for human occupancy on which there is a *work area* that includes exits or corridors shared by more than one tenant within the *work area* shall be provided with the minimum number of exits based on the occupancy and the occupant load in accordance with Chapter 10. In addition, the exits shall comply with Sections 3416.7.2.2 and 3416.7.2.3.

3416.7.2.2 (IEBC 805.3.1.1) Single-exit buildings. Only one exit is required from buildings and spaces of the following occupancies:

1. In Group A, B, E, F, M, U and S occupancies, a single exit is permitted in the story at the level of exit discharge when the occupant load of the story does not exceed 50 and the exit access travel distance does not exceed 75 feet (22 860 mm).
2. Group B, F-2, and S-2 occupancies not more than two stories in height that are not greater than 3,500 square feet per floor (326 m^2), when the exit access travel distance does not exceed 75 feet (22 860 mm). The minimum fire-resistance rating of the exit enclosure and of the opening protection shall be 1 hour.
3. Open parking structures where vehicles are mechanically parked.
4. In community residences for the developmentally disabled, the maximum occupant load excluding staff is 12.

5. Groups R-1 and R-2 not more than two stories in height, when there are not more than four dwelling units per floor and the exit access travel distance does not exceed 50 feet (15 240 mm). The minimum fire-resistance rating of the exit enclosure and of the opening protection shall be 1 hour.
6. In multilevel dwelling units in buildings of occupancy Group R-1 or R-2, an exit shall not be required from every level of the dwelling unit provided that one of the following conditions is met:
   6.1. The travel distance within the dwelling unit does not exceed 75 feet (22 860 mm); or
   6.2. The building is not more than three stories in height and all third-floor space is part of one or more dwelling units located in part on the second floor; and no habitable room within any such dwelling unit shall have a travel distance that exceeds 50 feet (15 240 mm) from the outside of the habitable room entrance door to the inside of the entrance door to the dwelling unit.
7. In Group R-2, H-4, H-5 and I occupancies and in rooming houses and child care centers, a single exit is permitted in a one-story building with a maximum occupant load of 10 and the exit access travel distance does not exceed 75 feet (22 860 mm).
8. In buildings of Group R-2 occupancy that are equipped throughout with an automatic fire sprinkler system, a single exit shall be permitted from a basement or story below grade if every dwelling unit on that floor is equipped with an approved window providing a clear opening of at least 5 square feet (0.47 m^2) in area, a minimum net clear opening of 24 inches (610 mm) in height and 20 inches (508 mm) in width, and a sill height of not more than 44 inches (1118 mm) above the finished floor.
9. In buildings of Group R-2 occupancy of any height with not more than four dwelling units per floor; with a smokeproof enclosure or outside stair as an exit; and with such exit located within 20 feet (6096 mm) of travel to the entrance doors to all dwelling units served thereby.
10. In buildings of Group R-3 occupancy equipped throughout with an automatic fire sprinkler system, only one exit shall be required from basements or stories below grade.

3416.7.2.3 (IEBC 805.3.1.2) Fire escapes allowed. When more than one exit is required, an existing or newly constructed fire escape complying with Section 3416.7.2.3.1 shall be accepted as providing one of the required means of egress.

3416.7.2.3.1 (IEBC 805.3.1.2.1) Fire escape access and details. Fire escapes shall comply with all of the following requirements:

1. Occupants shall have unobstructed access to the fire escape without having to pass through a room subject to locking.
2. Access to a new fire escape shall be through a door, except that windows shall be permitted to provide access from single dwelling units or sleeping units in Group R-1, R-2 and I-1 occupancies or to provide access from spaces having a maximum occupant load of 10 in other occupancy classifications.
   2.1. The window shall have a minimum net clear opening of 5.7 square feet (0.53 m^2) or 5 square feet (0.46 m^2) where located at grade.
   2.2. The minimum net clear opening height shall be 24 inches (610 mm) and net clear opening width shall be 20 inches (508 mm).
   2.3. The bottom of the clear opening shall not be greater than 44 inches (1118 mm) above the floor.
   2.4. The operation of the window shall comply with the operational constraints of this code.
3. Newly constructed fire escapes shall be permitted only where exterior stairs cannot be utilized because of lot lines limiting the stair size or because of the sidewalks, alleys, or roads at grade level.
4. Openings within 10 feet (3048 mm) of fire escape stairs shall be protected by fire assemblies having minimum 3/4 -hour fire-resistance ratings.

   Exception: Opening protection shall not be required in buildings equipped throughout with an approved automatic sprinkler system.

5. In all buildings of Group E occupancy, up to and including the 12th grade, buildings of Group I occupancy, rooming houses and childcare centers, ladders of any type are prohibited on fire escapes used as a required means of egress.

3416.7.2.3.2 (IEBC 805.3.1.2.2) Construction. The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of steel or other approved *noncombustible materials*. Fire escapes constructed of wood not less than nominal 2 inches (51 mm) thick are permitted on buildings of Type V construction. Walkways and railings located over or supported by combustible roofs in buildings of Types III and IV construction are permitted to be of wood not less than nominal 2 inches (51 mm) thick.

3416.7.2.3.3 (IEBC 805.3.1.2.3) Dimensions. Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm). Landings at the foot of stairs shall not be less than 40 inches (1016 mm) wide by 36 inches (914 mm) long and located not more than 8 inches (203 mm) below the door.

3416.7.2.4 (IEBC 805.3.2) Mezzanines. Mezzanines in the *work area* and with an occupant load of more than 50 or in which the travel distance to an exit exceeds 75 feet (22 860 mm) shall have access to at least two independent means of egress.

Exception: Two independent means of egress are not required where the travel distance to an exit does not exceed 100 feet (30 480 mm) and the building is protected throughout with an automatic sprinkler system.

3416.7.2.5 (IEBC 805.3.3) Main entrance—Group A. All buildings of Group A with an occupant load of 300 or more shall be provided with a main entrance capable of serving as the main exit with an egress capacity of at least one-half of the total occupant load. The remaining exits shall be capable of providing one-half of the total required exit capacity.

Exception: Where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

3416.7.3 (IEBC 805.4) Egress doorways. Egress doorways in any *work area* shall comply with Sections 3416.7.3.1 through 3416.7.3.5.

3416.7.3.1 (IEBC 805.4.1) Two egress doorways required. Work areas shall be provided with two egress doorways in accordance with the requirements of Sections 3416.7.3.1.1 and 3416.7.3.1.2.

3416.7.3.1.1 (IEBC 805.4.1.1) Occupant load and travel distance. In any *work area*, all rooms and spaces having an occupant load greater than 50 or in which the travel distance to an exit exceeds 75 feet (22 860 mm) shall have a minimum of two egress doorways.

Exceptions:

1. Storage rooms having a maximum occupant load of 10.
2. Where the *work area* is served by a single exit in accordance with Section 3416.7.2.2.

3416.7.3.1.2 (IEBC 805.4.1.2) Group I-2. In buildings of Group I-2 occupancy, any patient sleeping room or suite of patient rooms greater than 1,000 square feet (93 m2) within the *work area* shall have a minimum of two egress doorways.

3416.7.3.2 (IEBC 805.4.2) Door swing. In the *work area* and in the egress path from any *work area* to the exit discharge, all egress doors serving an occupant load greater than 50 shall swing in the direction of exit travel.

3416.7.3.2.1 (IEBC 805.4.2.1) Supplemental requirements for door swing. Where the *work area* exceeds 50 percent of the floor area, door swing shall comply with Section 3416.7.3.2 throughout the floor.

> **Exception:** Means of egress within or serving only a tenant space that is entirely outside the *work area*.

3416.7.3.3 (IEBC 805.4.3) Door closing. In any *work area*, all doors opening onto an exit passageway at grade or an exit stair shall be self-closing or automatic-closing by listed closing devices.

> **Exceptions:**
>
> 1. Where exit enclosure is not required by other provisions of this code.
> 2. Means of egress within or serving only a tenant space that is entirely outside the *work area*.

3416.7.3.3.1 (IEBC 805.4.3.1) Supplemental requirements for door closing. Where the *work area* exceeds 50 percent of the floor area, doors shall comply with Section 3416.7.3.3 throughout the exit stair from the *work area* to, and including, the level of exit discharge.

3416.7.3.4 (IEBC 805.4.4) Panic hardware. In any *work area*, and in the egress path from any *work area* to the exit discharge, in buildings or portions thereof of Group A assembly occupancies with an occupant load greater than 100, all required exit doors equipped with latching devices shall be equipped with approved panic hardware.

3416.7.3.4.1 (IEBC 805.44.1) Supplemental requirements for panic hardware. Where the *work area* exceeds 50 percent of the floor area, panic hardware shall comply with Section 3416.7.3.4 throughout the floor.

> **Exception:** Means of egress within a tenant space that is entirely outside the *work area*.

3416.7.3.5 (IEBC 805.4.5) Emergency power source in Group I-3. *Work areas* in buildings of Group I-3 occupancy having remote power unlocking capability for more than 10 locks shall be provided with an emergency power source for such locks. Power shall be arranged to operate automatically upon failure of normal power within 10 seconds and for a duration of not less than 1 hour.

3416.7.4 (IEBC 805.5) Openings in corridor walls. Openings in corridor walls in any *work area* shall comply with Sections 3416.7.4.1 through 3416.7.4.4.

> **Exception:** Openings in corridors where such corridors are not required to be rated in accordance with other provisions of this code.

3416.7.4.1 (IEBC 805.5.1) Corridor doors. Corridor doors in the *work area* shall not be constructed of hollow core wood and shall not contain louvers. All dwelling unit or sleeping unit corridor doors in work areas in buildings of Groups R-1, R-2, and I-1 shall be at least 1-3/8-inch (35 mm) solid core wood or approved equivalent and shall not have any glass panels, other than approved wired glass or other approved glazing material in metal frames. All dwelling unit or sleeping unit corridor doors in *work areas* in buildings of Groups R-1, R-2, and I-1 shall be equipped with approved door closers. All replacement doors shall be 1-3/4-inch (45 mm) solid bonded wood core or approved equivalent, unless the existing frame will accommodate only a 1-3/8-inch (35 mm) door.

> **Exceptions:**
>
> 1. Corridor doors within a dwelling unit or sleeping unit.
> 2. Existing doors meeting the requirements of Appendix N of the *International Existing Building Code, Guidelines on Fire Ratings of Archaic Materials and Assemblies,* for a rating of 15 minutes or more shall be accepted as meeting the provisions of this requirement.

3. Existing doors in buildings protected throughout with an approved automatic sprinkler system shall be required only to resist smoke, be reasonably tight fitting, and shall not contain louvers.
4. In group homes with a maximum of 15 occupants and that are protected with an approved automatic detection system, closing devices may be omitted.
5. Door assemblies having a fire protection rating of at least 20 minutes.

3416.7.4.2 (IEBC 805.5.2) Transoms. In all buildings of Group I-1, R-1 and R-2 occupancy, all transoms in corridor walls in work areas shall either be glazed with 1/4-inch (6.4 mm) wired glass set in metal frames or other glazing assemblies having a fire protection rating as required for the door and permanently secured in the closed position or sealed with materials consistent with the corridor construction.

3416.7.4.3 (IEBC 805.5.3) Other corridor openings. In any *work area*, any other sash, grille, or opening in a corridor and any window in a corridor not opening to the outside air shall be sealed with materials consistent with the corridor construction.

3416.7.4.3.1 (IEBC 805.5.3.1) Supplemental requirements for other corridor openings. Where the *work area* exceeds 50 percent of the floor area, Section 3416.7.4.3 shall be applicable to all corridor windows, grills, sashes, and other openings on the floor.

Exception: Means of egress within or serving only a tenant space that is entirely outside the *work area*.

3416.7.4.4 (IEBC 805.5.4) Supplemental requirements for corridor openings. Where the *work area* on any floor exceeds 50 percent of the floor area, the requirements of Sections 3416.7.4.1 through 3416.7.4.3 shall apply throughout the floor.

3416.7.5 (IEBC 805.6) Dead-end corridors. Dead-end corridors in any *work area* shall not exceed 35 feet (10 670 mm).

Exceptions:

1. Where dead-end corridors of greater length are permitted by Chapter 10.
2. In other than Group A and H occupancies, the maximum length of an existing dead-end corridor shall be 50 feet (15 240 mm) in buildings equipped throughout with an automatic fire alarm system installed in accordance with Chapter 9.
3. In other than Group A and H occupancies, the maximum length of an existing dead-end corridor shall be 70 feet (21 356 mm) in buildings equipped throughout with an automatic sprinkler system installed in accordance with Chapter 9.
4. In other than Group A and H occupancies, the maximum length of an existing, newly constructed, or extended dead-end corridor shall not exceed 50 feet (15 240 mm) on floors equipped with an automatic sprinkler system installed in accordance with Chapter 9.

3416.7.6 (IEBC 805.7) Means-of-egress lighting. Means-of-egress lighting shall be in accordance with this section, as applicable.

3416.7.6.1 (IEBC 805.7.1) Artificial lighting required. Means of egress in all work areas shall be provided with artificial lighting in accordance with the requirements of this code.

3416.7.6.2 (IEBC 805.7.2) Supplemental requirements for means-of egress lighting. Where the *work area* on any floor exceeds 50 percent of that floor area, means of egress throughout the floor shall comply with Section 3416.7.6.1.

Exception: Means of egress within or serving only a tenant space that is entirely outside the *work area*.

3416.7.7 (IEBC 805.8) Exit signs. Exit signs shall be in accordance with this section, as applicable.

3416.7.7.1 (IEBC 805.8.1) Work areas. Means of egress in all work areas shall be provided with exit signs in accordance with Chapter 10.

3416.7.7.2 (IEBC 805.8.2) Supplemental requirements for exit signs. Where the *work area* on any floor exceeds 50 percent of that floor area, means of egress throughout the floor shall comply with Section 3416.7.7.1.

Exception: Means of egress within a tenant space that is entirely outside the *work area*.

3416.7.8 (IEBC 805.9) Handrails. The requirements of Sections 3416.7.8.1 and 3416.7.8.2 shall apply to handrails from the *work area* floor to, and including, the level of exit discharge.

3416.7.8.1 (IEBC 805.9.1) Minimum requirement. Every required exit stairway that is part of the means of egress for any *work area* and that has three or more risers and is not provided with at least one handrail, or in which the existing handrails are judged to be in danger of collapsing, shall be provided with handrails for the full length of the run of steps on at least one side. All exit stairways with a required egress width of more than 66 inches (1676 mm) shall have handrails on both sides.

3416.7.8.2 (IEBC 805.9.2) Design. Handrails required in accordance with Section 3416.7.8.1 shall be designed and installed in accordance with the provisions of Chapter 10.

3416.7.9 (IEBC 805.10) Guards. The requirements of Sections 3416.7.9.1 and 3416.7.9.2 shall apply to guards from the *work area* floor to, and including, the level of exit discharge but shall be confined to the egress path of any *work area*.

3416.7.9.1 (IEBC 805.10.1) Minimum requirement. Every open portion of a stair, landing, or balcony that is more than 30 inches (762 mm) above the floor or grade below and is not provided with guards, or those portions in which existing guards are judged to be in danger of collapsing, shall be provided with guards.

3416.7.9.2 (IEBC 805.10.2) Design. Guards required in accordance with Section 3416.7.9.1 shall be designed and installed in accordance with this code.

3416.8 (IEBC 806.1) Accessibility. A building, *facility*, or element that is altered shall comply with this section and Section 3415.8.

3416.8.1 (IEBC 806.2) Stairs and escalators in existing buildings. In *alterations* where an escalator or stair is added where none existed previously, an accessible route shall be provided in accordance with Sections 1104.4 and 1104.5.

3416.8.2 (IEBC 806.3) Accessible dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for accessible units and Chapter 9 for visible alarms apply only to the quantity of spaces being added.

3416.8.3 (IEBC 806.4) Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 for Type A units and Chapter 9 for visible alarms apply only to the quantity of the spaces being added.

3416.8.4 (IEBC 806.5) Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for Type B units and Chapter 9 for visible alarms apply only to the quantity of the spaces being added.

3416.9 (IEBC [B] 807.1) Structural. Structural elements and systems within buildings undergoing Level 2 *alterations* shall comply with this section.

3416.9.1 (IEBC [B] 807.2) New structural elements. New structural elements in *alterations*, including connections and anchorage, shall comply with Chapter 16.

3416.9.2 (IEBC [B] 807.3) Minimum design loads. The minimum design loads on existing elements of a structure that do not support additional loads as a result of an *alteration* shall be the loads applicable at the time the building was constructed.

3416.9.3 (IEBC [B] 807.4) Existing structural elements carrying gravity loads. *Alterations* shall not reduce the capacity of existing gravity load-carrying structural elements unless it is demonstrated that the elements have the capacity to carry the applicable design gravity loads required by Chapter 16. Existing structural elements supporting any additional gravity loads as a result of the *alterations*, including the effects of snow drift, shall comply with Chapter 16.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and its *alteration* comply with the conventional light-frame construction methods of Chapter 16.

3416.9.4 (IEBC [B] 807.5) Existing structural elements resisting lateral loads. *Alterations* affecting the demands or capacities of existing elements of the lateral load-resisting system shall be evaluated using the wind provisions of Chapter 16 and the reduced Chapter 16-level seismic forces. Any existing lateral load-resisting structural elements whose demand-capacity ratio with the *alteration* considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be brought into compliance with those wind and seismic provisions. In addition, the *alteration* shall not create a structural irregularity prohibited by ASCE 7 unless the entire structure complies with Section 3401.6.4.2. For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of *additions* and *alterations* since the original construction.

3416.9.5 (IEBC [B] 807.6) Voluntary lateral force-resisting system alterations. *Alterations* of existing structural elements and additions of new structural elements that are initiated for the purpose of increasing the lateral force-resisting strength or stiffness of an existing structure and that are not required by other sections of this code shall not be required to be designed for forces conforming to Chapter 16, provided that an engineering analysis is submitted to show that:

1. The capacity of existing structural elements required to resist forces is not reduced;
2. The lateral loading to existing structural elements is not increased either beyond its capacity or more than 10 percent;
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16;
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16; and
5. A *dangerous* condition as defined in this code is not created. Voluntary *alterations* to lateral force-resisting systems conducted in accordance with Appendix A of the *International Existing Building Code* and the referenced standards of this code shall be permitted.

SECTION 3417 (IEBC CHAPTER 9)
LEVEL 3 ALTERATIONS

3417.1 (IEBC 901.1) Scope. Level 3 *alterations* as described in Section 3413.6 shall comply with the requirements of this section.

3417.2 (IEBC 901.2) Compliance. In addition to the provisions of this section, work shall comply with all of the requirements of Sections 3415 and 3416. The requirements of Sections 3416.5, 3416.6, and 3416.7 shall apply within all *work areas* whether or not they include exits and corridors shared by more than one tenant and regardless of the occupant load.

> **Exception:** Buildings in which the reconfiguration of space affecting exits or shared egress access is exclusively the result of compliance with the accessibility requirements of Section 3415.8.15 shall not be required to comply with this section.

3417.3 (IEBC 902.1) High-rise buildings. High rise buildings shall comply with the requirements of Sections 3417.3.1 and 3417.3.2.

3417.3.1 (IEBC 902.1.1) Recirculating air or exhaust systems. When a floor is served by a recirculating air or exhaust system with a capacity greater than 15,000 cubic feet per minute (701 m3/s), that system shall be equipped with approved smoke and heat detection devices installed in accordance with the *International Mechanical Code*.

3417.3.2 (IEBC 902.1.2) Elevators. Where there is an elevator or elevators for public use, at least one elevator serving the *work area* shall comply with this section. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1.

3417.4 (IEBC 902.2) Boiler and furnace equipment rooms. Boiler and furnace equipment rooms adjacent to or within the following facilities shall be enclosed by 1-hour fire-resistance-rated construction: day nurseries, children's shelter facilities, residential childcare facilities, and similar facilities with children below the age of 2-1/2 years or that are classified as Group I-2 occupancies, shelter facilities, residences for the developmentally disabled, group homes, teaching family homes, transitional living homes, rooming and boarding houses, hotels, and multiple dwellings.

Exceptions:

1. Furnace and boiler equipment of low-pressure type, operating at pressures of 15 pounds per square inch gauge (psig) (103.4 KPa) or less for steam equipment or 170 psig (1171 KPa) or less for hot water equipment, when installed in accordance with manufacturer recommendations.
2. Furnace and boiler equipment of residential R-3 type with 200,000 British thermal units (Btu) (2.11 × 108 J) per hour input rating or less is not required to be enclosed.
3. Furnace rooms protected with automatic sprinkler protection.

3417.5 (IEBC 903.1) Existing shafts and vertical openings. Existing stairways that are part of the means of egress shall be enclosed in accordance with Section 3416.5.1.1 from the highest *work area* floor to, and including, the level of exit discharge and all floors below.

3417.6 (IEBC 903.2) Fire partitions in Group R-3. Fire separation in Group R-3 occupancies shall be in accordance with Section 3417.6.1.

3417.6.1 (IEBC 903.2.1) Separation required. Where the *work area* is in any attached dwelling unit in Group R-3 or any multiple single-family dwelling (townhouse), walls separating the dwelling units that are not continuous from the foundation to the underside of the roof sheathing shall be constructed to provide a continuous fire separation using construction materials consistent with the existing wall or complying with the requirements for new structures. All work shall be performed on the side of the dwelling unit wall that is part of the *work area*.

Exception: Where *alterations* or *repairs* do not result in the removal of wall or ceiling finishes exposing the structure, walls are not required to be continuous through concealed floor spaces.

3417.7 (IEBC 903.3) Interior finish. Interior finish in exits serving the *work area* shall comply with Section 3416.5.3 between the highest floor on which there is a *work area* to the floor of exit discharge.

3417.8 (IEBC 904.1) Automatic sprinkler systems. Automatic sprinkler systems shall be provided in all work areas when required by Section 3416.6.2 or this section.

3417.8.1 (IEBC 904.1.1) High-rise buildings. In high-rise buildings, work areas shall be provided with automatic sprinkler protection where the building has a sufficient municipal water supply system to the site. Where the *work area* exceeds 50 percent of floor area, sprinklers shall be provided in the specified areas where sufficient municipal water supply for design and installation of a fire sprinkler system is available at the site.

3417.8.2 (IEBC 904.1.2) Rubbish and linen chutes. Rubbish and linen chutes located in the *work area* shall be provided with automatic sprinkler system protection or an approved automatic fire-extinguishing system where protection of the rubbish and linen chute would be required under the provisions of Chapter 9 for new construction.

3417.9 (IEBC 904.2) Fire alarm and detection systems. Fire alarm and detection systems complying with Sections 3416.6.4.1.1 and 3416.6.4.3 shall be provided throughout the building in accordance with Chapter 9.

3417.9.1 (IEBC 904.2.1) Manual fire alarm systems. Where required by other provisions of this code, a manual fire alarm system shall be provided throughout the *work area*. Alarm notification appliances shall be provided on such floors and shall be automatically activated as required by Chapter 9.

Exceptions:

1. Alarm-initiating and notification appliances shall not be required to be installed in tenant spaces outside of the *work area*.
2. Visual alarm notification appliances are not required, except where an existing alarm system is upgraded or replaced or where a new fire alarm system is installed.

3417.9.2 (IEBC 904.2.2) Automatic fire detection. Where required by this code for new buildings, automatic fire detection systems shall be provided throughout the *work area*.

3417.10 (IEBC 905.1) Means of egress. The means of egress shall comply with the requirements of Section 3416.7 except as specifically required in Sections 3417.10.1 and 3417.10.2.

3417.10.1 (IEBC 905.2) Means-of-egress lighting. Means of egress from the highest *work area* floor to the floor of exit discharge shall be provided with artificial lighting within the exit enclosure in accordance with the requirements of Chapter 10.

3417.10.2 (IEBC 905.3) Exit signs. Means of egress from the highest *work area* floor to the floor of exit discharge shall be provided with exit signs in accordance with the requirements of Chapter 10.

3417.11 (IEBC 906.1) Accessibility. A building, *facility* or element that is altered shall comply with this section and Sections 3415.8 and 3416.8.

3417.11.1 (IEBC 906.2) Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Type B units and Chapter 9 for visible alarms apply only to the quantity of the spaces being altered or added.

3417.12 (IEBC [B] 907.1) Structural. Where buildings are undergoing Level 3 *alterations* including structural *alterations*, the provisions of this section shall apply.

3417.12.1 (IEBC [B] 907.2) New structural elements. New structural elements shall comply with Section 3416.9.1.

3417.12.2 (IEBC [B] 907.3) Existing structural elements carrying gravity loads. Existing structural elements carrying gravity loads shall comply with Section 3416.9.3.

3417.12.3 (IEBC [B] 907.4) Existing structural elements resisting lateral loads. All existing elements of the lateral force-resisting system shall comply with this section.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes that are altered based on the conventional light-frame construction methods of Chapter 16.
2. Where such *alterations* involve only the lowest story of a building and the *change of occupancy* provisions of Section 3418 do not apply, only the lateral force-resisting components in and below that story need comply with this section.

3417.12.3.1 (IEBC [B] 907.4.1) Evaluation and analysis. An engineering evaluation and analysis that establishes the structural adequacy of the altered structure shall be prepared by a registered design professional and submitted to the *building official*.

3417.12.3.2 (IEBC [B] 907.4.2) Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural *alteration* within a five-year period, the evaluation and analysis shall demonstrate that the altered building or structure complies with Chapter 16 for wind loading and with reduced Chapter 16-level seismic forces. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

3417.12.3.3 (IEBC [B] 907.4.3) Limited structural alteration. Where the work does not involve a substantial structural *alteration*, the existing elements of the lateral load-resisting system shall comply with Section 3416.9.4.

3417.12.3.4 (IEBC [B] 907.4.4) Wall anchors for concrete and masonry buildings. For any building assigned to Seismic Design Category D, E or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm or unreinforced masonry walls with any type of roof diaphragm, the alteration work shall include installation of wall anchors at the roof line to resist the reduced Chapter 16-level seismic forces, unless an evaluation demonstrates compliance of existing wall anchorage.

3417.12.3.5 (IEBC [B] 907.4.5) Bracing for unreinforced masonry parapets. Parapets constructed of unreinforced masonry in buildings assigned to Seismic Design Category D, E or F shall have bracing installed as needed to resist the reduced Chapter 16-level seismic forces, unless an evaluation demonstrates compliance of such items.

SECTION 3418 (IEBC CHAPTER 10)
CHANGE OF OCCUPANCY

3418.1 (IEBC 1001.1) Scope. The provisions of this section shall apply where a *change of occupancy* occurs, including:

1. Where the occupancy classification is not changed; or
2. Where there is a change in occupancy classification or the occupancy group designation changes.

3418.2 (IEBC 1001.2) Change in occupancy with no change of occupancy classification. A *change in occupancy* with no change in occupancy classification shall not be made to any structure that will subject the structure to any special provisions of this code, including the provisions of Sections 3418.5 through 3418.14, without the approval of the *building official*. A certificate of occupancy shall be issued where it has been determined that the requirements for the change in occupancy have been met.

3418.2.1 (IEBC 1001.2.1) Repair and alteration with no change of occupancy classification. Any *repair* or *alteration* work undertaken in connection with a *change of occupancy* that does not involve a change in occupancy classification shall conform to the applicable requirements for the work as classified in Section 3413 and to the requirements of Sections 3418.5 through 3418.14.

Exception: As modified in Section 3420.21 for *historic buildings*.

3418.3 (IEBC 1001.3) Change of occupancy classification. Where the occupancy classification of a building changes, the provisions of Sections 3418.5 through 3418.15 shall apply. This includes a *change of occupancy* classification within a group as well as a *change of occupancy* classification from one group to a different group.

3418.3.1 (IEBC 1001.3.1) Partial change of occupancy classification. Where a portion of an *existing building* is changed to a new occupancy classification, Section 3418.1.15 shall apply.

3418.4 (IEBC 1001.4) Certificate of occupancy required. A certificate of occupancy shall be issued where a *change of occupancy* occurs that results in a different occupancy classification.

3418.5 (IEBC 1002.1) Special use and occupancy. Where the character or use of an *existing building* or part of an *existing building* is changed to one of the following special use or occupancy categories, the building shall comply with all of the applicable requirements of this code:

1. Covered and open mall buildings.
2. Atriums.
3. Motor vehicle-related occupancies.
4. Aircraft-related occupancies.
5. Motion picture projection rooms.
6. Stages and platforms.
7. Special amusement buildings.
8. Incidental use areas.
9. Hazardous materials.
10. Ambulatory care facilities.

3418.6 (IEBC 1002.2) Underground buildings. An underground building in which there is a change of use shall comply with the requirements of this code applicable to underground structures.

3418.7 (IEBC 1003.1) Building elements and materials. Building elements and materials in portions of buildings undergoing a change in occupancy classification shall comply with Section 3418.15.

3418.8 (IEBC 1004.1) Fire protection. Fire protection requirements of Section 3418.15 shall apply where a building or portions thereof undergo a change in occupancy classification.

3418.9 (IEBC 1005.1) Means of egress. Means of egress in portions of buildings undergoing a change in occupancy classification shall comply with Section 3418.15.

3418.10 (IEBC 1006.1) Accessibility. Accessibility in portions of buildings undergoing a change in occupancy classification shall comply with Section 3418.15.11.

3418.11 (IEBC [B] 1007.1) Gravity loads. Buildings or portions thereof subject to a *change of occupancy* where such change in the nature of occupancy results in higher uniform or concentrated loads based on Table 1607.1 shall comply with the gravity load provisions of this code.

Exception: Structural elements whose stress is not increased by more than 5 percent.

3418.12 (IEBC [B] 1007.2) Snow and wind loads. Buildings and structures subject to a *change of occupancy* where such change in the nature of occupancy results in higher wind or snow risk categories based on Table 1604.5 shall be analyzed and shall comply with the applicable wind or snow load provisions of this code.

Exception: Where the new occupancy with a higher risk category is less than or equal to 10 percent of the total building floor area. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.

3418.13 (IEBC [B] 1007.3) Seismic loads. *Existing buildings* with a *change of occupancy* shall comply with the seismic provisions of Sections 3418.13.1 and 3418.13.2.

3418.13.1 (IEBC [B] 1007.3.1) Compliance with Chapter 16 level seismic forces. Where a building or portion thereof is subject to a *change of occupancy* that results in the building being assigned to a higher risk category based on Table 1604.5; or where such *change of occupancy* results in a reclassification of a building to a higher hazard category as shown in Table 3418.15.7; or where a change of a Group M occupancy to a Group A, E, I-1, R-1, R-2 or R-4 occupancy with two-thirds or more of the floors involved in Level 3 *alteration* work, the building shall comply with the requirements for Chapter 16 level seismic forces as specified in Section 3401.6.4.1 for the new risk category.

Exceptions:

1. Group M occupancies being changed to Group A, E, I-1, R-1, R-2 or R-4 occupancies for buildings less than six stories in height and in Seismic Design Category A, B or C.
2. Where approved by the *building official*, specific detailing provisions required for a new structure are not required to be met where it can be shown that an equivalent level of performance and seismic safety is obtained for the applicable risk category based on the provision for reduced Chapter 16 level seismic forces as specified in Section 3401.6.4.2.
3. Where the area of the new occupancy with a higher hazard category is less than or equal to 10 percent of the total building floor area and the new occupancy is not classified as Risk Category IV. For the purposes of this exception, buildings occupied by two or more occupancies not included in the same Risk category, shall be subject to the provisions of Section 1604.5.1. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.
4. Unreinforced masonry bearing wall buildings in Risk Category III when assigned to Seismic Design Category A or B shall be allowed to be strengthened to meet the requirements of Appendix Chapter A1 of the *International Existing Building Code* [Guidelines for the Seismic Retrofit of Existing Buildings (GSREB)].

3418.13.2 (IEBC [B] 1007.3.2) Access to Risk Category IV. Where a *change of occupancy* is such that compliance with Section 3418.13.1 is required and the building is assigned to Risk Category IV, the operational access to the building shall not be through an adjacent structure, unless that structure conforms to the requirements for Risk Category IV structures. Where operational access is less than 10 feet (3048 mm) from either an interior lot line or from another structure, access protection from potential falling debris shall be provided by the owner of the Risk Category IV structure.

3418.14 (IEBC 1011.1) Light and ventilation. Light and ventilation shall comply with the requirements of this code for the new occupancy.

3418.15 (IEBC 1012.1) Change of occupancy classification. The provisions of this section shall apply to buildings or portions thereof undergoing a change of occupancy classification. This includes a change of occupancy classification within a group as well as a change of occupancy classification from one group to a different group. Such buildings shall also comply with Sections 3418.5 through 3418.14.

3418.15.1 (IEBC 1012.1.1) Compliance with Section 3417. The requirements of Section 3417 shall be applicable throughout the building for the new occupancy classification based on the separation conditions set forth in Sections 3418.15.1.1 and 3418.15.1.2.

3418.15.1.1 (IEBC 1012.1.1.1) Change of occupancy classification without separation. Where a portion of an *existing building* is changed to a new occupancy classification and that portion is not separated from the remainder of the building with fire barriers having a fire-resistance rating as required for the separate occupancy, the entire building shall comply with all of the requirements of Section 3417 applied throughout the building for the most restrictive occupancy classification in the building and with the requirements of this section.

3418.15.1.2 (IEBC 1012.1.1.2) Change of occupancy classification with separation. Where a portion of an *existing building* that is changed to a new occupancy classification and that portion is separated from the remainder of the building with fire barriers having a fire-resistance rating as required for the separate occupancy, that portion shall comply with all of the requirements of Section 3417 for the new occupancy classification and with the requirements of this section.

3418.15.2 (IEBC 1012.1.2) Fire protection and interior finish. The provisions of Sections 3418.15.5 and 3418.15.6 for fire protection and interior finish, respectively, shall apply to all buildings undergoing a change of occupancy classification.

3418.15.3 (IEBC 1012.1.3) Change of occupancy classification based on hazard category. The relative degree of hazard between different occupancy classifications shall be determined in accordance with the categories specified in Tables 3418.15.7, 3415.15.8 and 3418.15.9. Such a determination shall be the basis for the application of Sections 3418.15.7 through 3418.15.10.

3418.15.4(IEBC 1012.1.4) Accessibility. All buildings undergoing a change of occupancy classification shall comply with Section 3418.15.11.

3418.15.5 (IEBC 1012.2) Fire protection systems. Fire protection systems shall be provided in accordance with Sections 3418.15.5.1 and 3418.15.5.2.

3418.15.5.1 (IEBC 1012.2.1) Fire sprinkler system. Where a change in occupancy classification occurs that requires an automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9, such system shall be provided throughout the area where the *change of occupancy* occurs.

3418.15.5.2 (IEBC 1012.2.2) Fire alarm and detection system. Where a change in occupancy classification occurs that requires a fire alarm and detection system to be provided based on the new occupancy in accordance with Chapter 9, such system shall be provided throughout the area where the *change of occupancy* occurs. Existing alarm notification appliances shall be automatically activated throughout the building. Where the building is not equipped with a fire alarm system, alarm notification appliances shall be provided throughout the area where the *change of occupancy* occurs and shall be automatically activated.

3418.15.6 (IEBC 1012.3) Interior finish. In areas of the building undergoing the change of occupancy classification, the interior finish of walls and ceilings shall comply with the requirements for the new occupancy classification.

3418.15.7 (IEBC 1012.4) Means of egress, general. Hazard categories in regard to life safety and means of egress shall be in accordance with Table 3418.5.7.

TABLE 3418.15.7 (IEBC TABLE 1012.4)
MEANS OF EGRESS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	I-2, I-3, I-4
3	A, E, I-1, M, R-1, R-2, R-4
4	B, F-1, R-3, S-1
5 (Lowest Hazard)	F-2, S-2, U

3418.15.7.1 (IEBC 1012.4.1) Means of egress for change to higher hazard category. When a change of occupancy classification is made to a higher hazard category (lower number) as shown in Table 3418.15.7, the means of egress shall comply with the requirements of Chapter 10.

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 3417.5.
2. Existing stairways including handrails and guards complying with the requirements of Section 3417 shall be permitted for continued use subject to approval of the *building official*.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed on both sides of wood lath and plaster in good condition or 1/2-inch-thick (12.7 mm) gypsum wallboard shall be permitted. Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.
5. Existing corridor doorways, transoms and other corridor openings shall comply with the requirements in Sections 3416.7.4.1, 3416.7.4.2 and 3416.7.4.3.
6. Existing dead-end corridors shall comply with the requirements in Section 805.6.
7. An existing operable window with clear opening area no less than 4 square feet (0.38 m^2) and minimum opening height and width of 22 inches (559 mm) and 20 inches (508 mm), respectively, shall be allowed as an emergency escape and rescue opening.

3418.15.7.2 (IEBC 1012.4.2) Means of egress for change of use to equal or lower hazard category. When a change of occupancy classification is made to an equal or lesser hazard category (higher number) as shown in Table 3418.15.7, existing elements of the means of egress shall comply with the requirements of Section 3417.10 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10.

Exception: Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.

3418.15.7.3 (IEBC 1012.4.3) Egress capacity. Egress capacity shall meet or exceed the occupant load as specified for the new occupancy.

3418.15.7.4 (IEBC 1012.4.4) Handrails. Existing stairways shall comply with the handrail requirements of Section 3416.7.8 in the area of the change of occupancy classification.

3418.15.7.5 (IEBC 1012.4.5) Guards. Existing guards shall comply with the requirements in Section 3416.7.9 in the area of the change of occupancy classification.

3418.15.8 (IEBC 1012.5) Heights and areas. Hazard categories in regard to height and area shall be in accordance with Table 3418.15.8.

TABLE 3418.15.8 (IEBC TABLE 1012.5)
HEIGHTS AND AREAS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	A-1, A-2, A-3, A-4, I, R-1, R-2, R-4
3	E, F-1, S-1, M
4 (Lowest Hazard)	B, F-2, S-2, A-5, R-3, U

3418.15.8.1 (IEBC 1012.5.1) Height and area for change to higher hazard category. When a change of occupancy classification is made to a higher hazard category as shown in Table 3418.15.8, heights and areas of buildings and structures shall comply with the requirements of Chapter 5 for the new occupancy classification.

> **Exception:** In other than Groups H, F-1 and S-1, in lieu of fire walls, use of fire barriers having a fire-resistance rating of not less than that specified in Table 706.4, constructed in accordance with Section 707, shall be permitted to meet area limitations required for the new occupancy in buildings protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

3418.15.8.1.1 (IEBC 1012.5.1.1) Fire wall alternative. In other than Groups H, F-1 and S-1, fire barriers and horizontal assemblies constructed in accordance with Sections 707 and 711, respectively, shall be permitted to be used in lieu of fire walls to subdivide the building into separate buildings for the purpose of complying with the area limitations required for the new occupancy where all of the following conditions are met:

1. The buildings are protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. The maximum allowable area between fire barriers, horizontal assemblies, or any combination thereof shall not exceed the maximum allowable area determined in accordance with Chapter 5 without an increase allowed for an automatic sprinkler system in accordance with Section 506.
3. The fire-resistance rating of the fire barriers and horizontal assemblies shall not be less than that specified for fire walls in Table 706.4.

   Exception: Where horizontal assemblies are used to limit the maximum allowable area, the required fire-resistance rating of the horizontal assemblies shall be permitted to be reduced by 1 hour provided the height and number of stories increases allowed for an automatic sprinkler system by Section 504.2 are not used for the buildings.

3418.15.8.2 (IEBC 1012.5.2) Height and area for change to equal or lesser hazard category. When a change of occupancy classification is made to an equal or lesser hazard category as shown in Table 3418.15.8, the height and area of the *existing building* shall be deemed acceptable.

3418.15.8.3 (IEBC 1012.5.3) Fire barriers. When a change of occupancy classification is made to a higher hazard category as shown in Table 3418.15.8, fire barriers in separated mixed use buildings shall comply with the fire-resistance requirements of this code.

> **Exception:** Where the fire barriers are required to have a 1-hour fire-resistance rating, existing wood lath and plaster in good condition or existing 1/2-inch-thick (12.7 mm) gypsum wallboard shall be permitted.

3418.15.9 (IEBC 1012.6) Exterior wall fire-resistance ratings. Hazard categories in regard to fire-resistance ratings of exterior walls shall be in accordance with Table 3418.15.9.

TABLE 3418.15.9 (IEBC TABLE 1012.6)
EXPOSURE OF EXTERIOR WALLS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	F-1, M, S-1
3	A, B, E, I, R
4 (Lowest Hazard)	F-2, S-2, U

3418.15.9.1 (IEBC 1012.6.1) Exterior wall rating for change of occupancy classification to a higher hazard category. When a change of occupancy classification is made to a higher hazard category as shown in Table 3418.15.9, exterior walls shall have fire resistance and exterior opening protectives as required by this code.

Exception: A 2-hour fire-resistance rating shall be allowed where the building does not exceed three stories in height and is classified as one of the following groups: A-2 and A-3 with an occupant load of less than 300, B, F, M or S.

3418.15.9.2 (IEBC 1012.6.2) Exterior wall rating for change of occupancy classification to an equal or lesser hazard category. When a change of occupancy classification is made to an equal or lesser hazard category as shown in Table 3418.15.9, existing exterior walls, including openings, shall be accepted.

3418.15.9.3 (IEBC 1012.6.3) Opening protectives. Openings in exterior walls shall be protected as required by this code. Where openings in the exterior walls are required to be protected because of their distance from the lot line, the sum of the area of such openings shall not exceed 50 percent of the total area of the wall in each story.

Exceptions:

1. Where this code permits openings in excess of 50 percent.
2. Protected openings shall not be required in buildings of Group R occupancy that do not exceed three stories in height and that are located not less than 3 feet (914 mm) from the lot line.
3. Where exterior opening protectives are required, an automatic sprinkler system throughout may be substituted for opening protection.
4. Exterior opening protectives are not required when the change of occupancy group is to an equal or lower hazard classification in accordance with Table 3418.15.9.

3418.15.10 (IEBC 1012.7) Enclosure of vertical shafts. Enclosure of vertical shafts shall be in accordance with Sections 3418.15.10.1 through 3418.15.10.4.

3418.15.10.1 (IEBC 1012.7.1) Minimum requirements. Vertical shafts shall be designed to meet the requirements of this code for atriums or this section.

3418.15.10.2 (IEBC 1012.7.2) Stairways. When a change of occupancy classification is made to a higher hazard category as shown in Table 3418.15.7, interior stairways shall be enclosed as required by this code.

Exceptions:

1. In other than Group I occupancies, an enclosure shall not be required for openings serving only one adjacent floor and that are not connected with corridors or stairways serving other floors.
2. Unenclosed existing stairways need not be enclosed in a continuous vertical shaft if each story is separated from other stories by 1-hour fire-resistance-rated construction or approved

wired glass set in steel frames and all exit corridors are sprinklered. The openings between the corridor and the occupant space shall have at least one sprinkler head above the openings on the tenant side. The sprinkler system shall be permitted to be supplied from the domestic water supply systems, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.

3. Existing penetrations of stairway enclosures shall be accepted if they are protected in accordance with this code.

3418.15.10.3 (IEBC 1012.7.3) Other vertical shafts. Interior vertical shafts other than stairways, including but not limited to elevator hoistways and service and utility shafts, shall be enclosed as required by this code when there is a change of use to a higher hazard category as specified in Table 3418.15.7.

Exceptions:

1. Existing 1-hour interior shaft enclosures shall be accepted where a higher rating is required.
2. Vertical openings, other than stairways, in buildings of other than Group I occupancy and connecting less than six stories shall not be required to be enclosed if the entire building is provided with an approved automatic sprinkler system.

3418.15.10.4 (IEBC 1012.7.4) Openings. All openings into existing vertical shaft enclosures shall be protected by fire assemblies having a fire protection rating of not less than 1 hour and shall be maintained self-closing or shall be automatic-closing by actuation of a smoke detector. All other openings shall be fire protected in an approved manner. Existing fusible link-type automatic door-closing devices shall be permitted in all shafts except stairways if the fusible link rating does not exceed 135°F (57°C).

3418.15.11 (IEBC 1012.8) Accessibility. *Existing buildings* that undergo a change of group or occupancy classification shall comply with this section.

Exception: Type B dwelling or sleeping units required by Section 1107 are not required to be provided in existing buildings and facilities undergoing a *change of occupancy* in conjunction with less than a Level 3 *alteration*.

3418.15.11.1 (IEBC 1012.8.1) Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any *alteration* shall comply with Sections 3415.8, 3416.8 and 3417.11, as applicable.

3418.15.11.2 (IEBC 1012.8.2) Complete change of occupancy. Where an entire building undergoes a *change of occupancy*, it shall comply with Section 3418.15.11.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to *primary function* areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is *technically infeasible* to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Exception: The accessible features listed in Items 1 through 6 are not required for an accessible route to Type B units.

SECTION 3419 (IEBC CHAPTER 11)
ADDITIONS

3419.1 (IEBC 1101.1) Scope. An *addition* to a building or structure shall comply with this code as adopted for new construction without requiring the *existing building* or structure to comply with any requirements of this code or of these provisions, except as required by this section. Where an *addition* impacts the *existing building* or structure, that portion shall comply with this code.

3419.2 (IEBC 1101.2) Creation or extension of nonconformity. An *addition* shall not create or extend any nonconformity in the *existing building* to which the *addition* is being made with regard to accessibility, structural strength, fire safety, means of egress.

3419.3 (IEBC 1101.3) Other work. Any *repair* or *alteration* work within an *existing building* to which an *addition* is being made shall comply with the applicable requirements for the work as classified in Section 3413.

3419.4 (IEBC 1102.1) Height limitations. No *addition* shall increase the height of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 for new buildings.

3419.5 (IEBC 1102.2) Area limitations. No *addition* shall increase the area of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 for new buildings unless fire separation as required by this code is provided.

> **Exception:** In-filling of floor openings and nonoccupiable appendages such as elevator and exit stair shafts shall be permitted beyond that permitted by this code.

3419.6 (IEBC 1102.3) Fire protection systems. Existing fire areas increased by the *addition* shall comply with Chapter 9.

3419.7 (IEBC [B] 1103.1) Structural. *Additions* to *existing buildings* or structures are new construction and shall comply with this code.

3419.7.1 (IEBC [B] 1103.2) Additional gravity loads. Existing structural elements supporting any additional gravity loads as a result of additions shall comply with this code.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with no more than five dwelling units or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of this code.

3419.7.2 (IEBC [B] 1103.3) Lateral force-resisting system. The lateral force-resisting system of *existing buildings* to which additions are made shall comply with Sections 3419.7.2.1, 3419.7.2.2 and 3419.7.2.3.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of this code.
2. In other *existing buildings* where the lateral-force story shear in any story is not increased by more than 10 percent cumulative.

3419.7.2.1 (IEBC [B] 1103.3.1) Vertical addition. Any element of the lateral force-resisting system of an *existing building* subjected to an increase in vertical or lateral loads from the vertical *addition* shall comply with the wind provisions of Chapter 16 and the IBC-level seismic forces specified in Section 3401.6.4.1 of this code.

3419.7.2.2 (IEBC [B] 1103.3.2) Horizontal addition. Where horizontal *additions* are structurally connected to an existing structure, all lateral force-resisting elements of the existing structure affected by such *addition* shall comply with the wind provisions of Chapter 16 and the IBC level seismic forces specified in Section 3401.6.4.1 of this code.

3419.7.2.3 (IEBC [B] 1103.3.3) Voluntary addition of structural elements to improve the lateral force-resisting system. Voluntary addition of structural elements to improve the lateral force-resisting system of an *existing building* shall comply with Section 3416.9.5.

3419.7.3 (IEBC [B] 1103.4) Snow drift loads. Any structural element of an *existing building* subjected to additional loads from the effects of snow drift as a result of an *addition* shall comply with this code.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with no more than five dwelling units or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of this code.

3419.7.4 (IEBC [B] 1103.5) Flood hazard areas. *Additions* and foundations in *flood hazard areas* shall comply with the following requirements:

1. For horizontal *additions* that are structurally interconnected to the *existing building*:
   1.1. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612.
   1.2. If the *addition* constitutes *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612.
2. For horizontal *additions* that are not structurally interconnected to the *existing building*:
   2.1. The *addition* shall comply with Section 1612.
   2.2. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612.
3. For vertical additions and all other proposed work that, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612.
4. For a new, replacement, raised, or extended foundation, if the foundation work and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612.

3419.8 (IEBC [B] 1104.1) Smoke alarms in existing portions of Group R and I-1 buildings. Where an *addition* is made to a building or structure of a Group R or I-1 occupancy, the *existing building* shall be provided with smoke alarms as required by Section 1103.8 of the *International Fire Code*.

3419.9 (IEBC [B] 1105.1) Accessibility. Accessibility provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, *primary function* shall comply with the requirements of Sections 3415.8, 3416.8 and 3417.11, as applicable.

SECTION 3420 (IEBC CHAPTER 12) HISTORIC BUILDINGS

3420.1 (IEBC 1201.1) Scope. It is the intent of this section to provide means for the preservation of *historic buildings*. Historical buildings shall comply with the provisions of this section relating to their *repair*, *alteration*, relocation and *change of occupancy*.

3420.2 (IEBC [B] 1201.2) Report. A *historic building* undergoing *repair*, *alteration*, or *change of occupancy* shall be investigated and evaluated. If it is intended that the building meet the requirements of this section, a written report shall be prepared and filed with the *building official* by a registered design professional when such a report is necessary in the opinion of the *building official*. Such report shall identify each required safety feature that is in compliance with this section and where compliance with other sections of these provisions would be damaging to the contributing historic features. For buildings assigned to Seismic Design Category D, E or F, a structural evaluation describing, at a minimum, the vertical and horizontal elements of the lateral force-resisting system and any strengths or weaknesses therein shall be prepared. Additionally, the report shall describe each feature that is not in compliance with these provisions and shall demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety.

3420.3 (IEBC 1201.3) Special occupancy exceptions—museums. When a building in Group R-3 is also used for Group A, B, or M purposes such as museum tours, exhibits, and other public assembly activities, or for museums less than 3,000 square feet (279 m2), the *building official* may determine that the occupancy is Group B when life-safety conditions can be demonstrated in accordance with Section 3420.2. Adequate means of egress in such buildings, which may include a means of maintaining doors in an open position to permit egress, a limit on building occupancy to an occupant load permitted by the means of egress capacity, a limit on occupancy of certain areas or floors, or supervision by a person knowledgeable in the emergency exiting procedures, shall be provided.

3420.4 (IEBC [B] 1201.4) Flood hazard areas. In *flood hazard areas*, if all proposed work, including repairs, work required because of a *change of occupancy*, and *alterations*, constitutes *substantial improvement*, then the *existing building* shall comply with Section 1612.

> **Exception:** If an *historic building* will continue to be an *historic building* after the proposed work is completed, then the proposed work is not considered a *substantial improvement*. For the purposes of this exception, an *historic building* is:
>
> 1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;
> 2. Determined by the Secretary of the U.S. Department of Interior to contribute to the historical significance of a registered historic district or a district preliminarily determined to qualify as a historic district; or
> 3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

3420.5 (IEBC 1202.1) Repairs. Repairs to any portion of an *historic building* or structure shall be permitted with original or like materials and original methods of construction, subject to the provisions of this section. Hazardous materials, such as asbestos and lead-based paint, shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

3420.6 (IEBC 1202.2) Unsafe conditions. Conditions determined by the *building official* to be *unsafe* shall be remedied. No work shall be required beyond what is required to remedy the *unsafe* conditions.

3420.7 (IEBC 1202.3) Relocated buildings. Foundations of relocated *historic buildings* and structures shall comply with this code. Relocated *historic buildings* shall otherwise be considered an *historic building* for the purposes of this code. Relocated *historic buildings* and structures shall be sited so that exterior wall and opening requirements comply with this code.

3420.8 (IEBC 1202.4) Replacement. Replacement of existing or missing features using original materials shall be permitted. Partial replacement for repairs that match the original in configuration, height, and size shall be permitted. Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24.

Exception: Glass block walls, louvered windows, and jalousies repaired with like materials.

3420.9 (IEBC 1203.2) Fire extinguishing systems. Every *historic building* that does not conform to the construction requirements specified in this code for the occupancy or use and that constitutes a distinct fire hazard as defined herein shall be provided with an approved automatic fire-extinguishing system as determined appropriate by the *building official*. However, an automatic fire-extinguishing system shall not be used to substitute for, or act as an alternative to, the required number of exits from any *facility*.

3420.10 (IEBC 1203.3) Means of egress. Existing door openings and corridor and stairway widths less than those specified elsewhere in this code may be approved, provided that, in the opinion of the *building official*, there is sufficient width and height for a person to pass through the opening or traverse the means of egress. When approved by the *building official*, the front or main exit doors need not swing in the direction of the path of exit travel, provided that other approved means of egress having sufficient capacity to serve the total occupant load are provided.

3420.11 (IEBC 1203.4) Transoms. In fully sprinklered buildings of Group R-1, R-2 or R-3 occupancy, existing transoms in corridors and other fire-resistance-rated walls may be maintained if fixed in the closed position. A sprinkler shall be installed on each side of the transom.

3420.12 (IEBC 1203.5) Interior finishes. The existing finishes of walls and ceilings shall be accepted when it is demonstrated that they are the historic finishes.

3420.13 (IEBC 1203.6) Stairway enclosure. In buildings of three stories or less, exit enclosure construction shall limit the spread of smoke by the use of tight-fitting doors and solid elements. Such elements are not required to have a fire-resistance rating.

3420.14 (IEBC 1203.7) One-hour fire-resistant assemblies. Where 1-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood or metal lath and plaster.

3420.15 (IEBC 1203.8) Glazing in fire-resistance-rated systems. Historic glazing materials are permitted in interior walls required to have a 1-hour fire-resistance rating where the opening is provided with approved smoke seals and the area affected is provided with an automatic sprinkler system.

3420.16 (IEBC 1203.9) Stairway railings. Grand stairways shall be accepted without complying with the handrail and guard requirements. Existing handrails and guards at all stairs shall be permitted to remain, provided they are not structurally *dangerous*.

3420.17 (IEBC 1203.10) Guards. Guards shall comply with Sections 3420.17.1 and 3420.17.2.

3420.17.1 (IEBC 1203.10.1) Height. Existing guards shall comply with the requirements of Section 3414.9.

3420.17.2 (IEBC 1203.10.2) Guard openings. The spacing between existing intermediate railings or openings in existing ornamental patterns shall be accepted. Missing elements or members of a guard may be replaced in a manner that will preserve the historic appearance of the building or structure.

3420.18(IEBC 1203.11) Exit signs. Where exit sign or egress path marking location would damage the historic character of the building, alternative exit signs are permitted with approval of the *building official*. Alternative signs shall identify the exits and egress path.

3420.19 (IEBC 1203.12) Automatic fire-extinguishing systems. Every historical building that cannot be made to conform to the construction requirements specified in this code for the occupancy or use and that constitutes a distinct fire hazard shall be deemed to be in compliance if provided with an approved automatic fire-extinguishing system.

Exception: When the *building official* approves an alternative life-safety system.

3420.20 (IEBC 1204.1) Accessibility requirements. The provisions of Sections 3415.8, 3416.8 and 3417.11, as applicable, shall apply to facilities designated as historic structures that undergo *alterations*, unless *technically infeasible*. Where compliance with the requirements for accessible routes, entrances or toilet rooms would threaten or destroy the historic significance of the building or *facility*, as determined by the *building official*, the alternative requirements of Sections 3420.20.1 through 3420.20.4 for that element shall be permitted.

Exception: Type B dwelling or sleeping units required by Section 1107 are not required to be provided in historical buildings.

3420.20.1 (IEBC 1204.1.1) Site arrival points. At least one main entrance shall be accessible.

3420.20.2 (IEBC 1204.1.2) Multilevel buildings and facilities. An accessible route from an accessible entrance to public spaces on the level of the accessible entrance shall be provided.

3420.20.3 (IEBC 1204.1.3) Entrances. At least one main entrance shall be accessible.

Exceptions:

1. If a main entrance cannot be made accessible, an accessible nonpublic entrance that is unlocked while the building is occupied shall be provided; or
2. If a main entrance cannot be made accessible, a locked accessible entrance with a notification system or remote monitoring shall be provided.

3420.20.4 (IEBC 1204.1.4) Toilet and bathing facilities. Where toilet rooms are provided, at least one accessible family or assisted-use toilet room complying with Section 1109.2.1 shall be provided.

3420.21 (IEBC 1205.1) Change of occupancy. *Historic buildings* undergoing a *change of occupancy* shall comply with the applicable provisions of Section 3418, except as specifically permitted in this section. When Section 3418 requires compliance with specific requirements of Sections 3415, 3416 or 3417 and when those requirements are subject to the exceptions in Section 3419.4 through 3419.6, the same exceptions shall apply to this section.

3420.21.1 (IEBC 1205.2) Building area. The allowable floor area for *historic buildings* undergoing a *change of occupancy* shall be permitted to exceed by 20 percent the allowable areas specified in Chapter 5.

3420.21.2 (IEBC 1205.3) Location on property. Historic structures undergoing a change of use to a higher hazard category in accordance with Section 3418.15.9 may use alternative methods to comply with the fire-resistance and exterior opening protective requirements. Such alternatives shall comply with Section 3420.2.

3420.21.3 (IEBC 1205.4) Occupancy separation. Required occupancy separations of 1 hour may be omitted when the building is provided with an approved automatic sprinkler system throughout.

3420.21.4 (IEBC 1205.5) Roof covering. Regardless of occupancy or use group, roof-covering materials not less than Class C shall be permitted where a fire-retardant roof covering is required.

3420.21.5 (IEBC 1205.6) Means of egress. Existing door openings and corridor and stairway widths less than those that would be acceptable for non-historic buildings under these provisions shall be approved, provided that, in the opinion of the *building official*, there is sufficient width and height for a person to pass through the opening or traverse the exit and that the capacity of the exit system is adequate for the occupant load, or where other operational controls to limit occupancy are approved by the *building official*.

3420.21.6 (IEBC 1205.7) Door swing. When approved by the *building official*, existing front doors need not swing in the direction of exit travel, provided that other approved exits having sufficient capacity to serve the total occupant load are provided.

3420.21.7 (IEBC 1205.8) Transoms. In corridor walls required by these provisions to be fire-resistance rated, existing transoms may be maintained if fixed in the closed position, and fixed wired glass set in a steel frame or other approved glazing shall be installed on one side of the transom.

Exception: Transoms conforming to Section 3420.11 shall be accepted.

3420.21.8 (IEBC 1205.9) Finishes. Where interior finish materials are required to have a flame spread index of Class C or better, existing nonconforming materials shall be surfaced with approved fire-retardant paint or finish.
Exception: Existing nonconforming materials need not be surfaced with an approved fire-retardant paint or finish where the building is equipped throughout with an automatic sprinkler system installed in accordance with this code and the nonconforming materials can be substantiated as being historic in character.

3420.21.9 (IEBC 1205.10) One-hour fire-resistant assemblies. Where 1-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood lath and plaster.

3420.21.10 (IEBC 1205.11) Stairs and railings. Existing stairways shall comply with the requirements of these provisions. The *building official* shall grant alternatives for stairways and railings if alternative stairways are found to be acceptable or are judged to meet the intent of these provisions. Existing stairways shall comply with Section 3420.9 through 3420.19.

Exception: For buildings less than 3,000 square feet (279 m2), existing conditions are permitted to remain at all stairs and rails.

3420.21.11 (IEBC 1205.12) Exit signs. The *building official* may accept alternative exit sign locations where such signs would damage the historic character of the building or structure. Such signs shall identify the exits and exit path.

3420.21.12 (IEBC [B] 1205.13) Exit stair live load. Existing historic stairways in buildings changed to a Group R-1 or R-2 occupancy shall be accepted where it can be shown that the stairway can support a 75-pounds-per-square-foot (366 kg/m2) live load.

3420.21.13 (IEBC 1205.14) Natural light. When it is determined by the *building official* that compliance with the natural light requirements of Section 3418.14 will lead to loss of historic character or historic materials in the building, the existing level of natural lighting shall be considered acceptable.

3420.21.14 (IEBC 1205.15) Accessibility requirements. The provisions of Section 3418.15.11 shall apply to facilities designated as historic structures that undergo a *change of occupancy*, unless *technically infeasible*. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet rooms would threaten or destroy the historic significance of the building or *facility*, as determined by the authority having jurisdiction, the alternative requirements of Sections 3420.1 through 3420.20.4 for those elements shall be permitted.

Exception: Type B dwelling or sleeping units required by Section 1107 are not required to be provided in historical buildings.

3420.22 (IEBC [B] 1206.1) Structural. *Historic buildings* shall comply with the applicable structural provisions for the work as classified in Section 3413.

Exception: The *building official* shall be authorized to accept existing floors and approve operational controls that limit the live load on any such floor.

3420.22.1 (IEBC [B] 1206.2) Dangerous conditions. Conditions determined by the *building official* to be *dangerous* shall be remedied. No work shall be required beyond what is required to remedy the *dangerous* condition.

SECTION 3421 (IEBC CHAPTER 13)
RELOCATED OR MOVED BUILDINGS

3421.1 (IEBC 1301.1) Relocated or moved buildings. This section provides requirements for relocated or moved structures.

3421.2 (IEBC 1301.2) Conformance. The building shall be safe for human occupancy as determined by the *International Fire Code* and the *International Property Maintenance Code*. Any *repair*, *alteration*, or *change of occupancy* undertaken within the moved structure shall comply with the requirements of this code applicable to the work being performed. Any field-fabricated elements shall comply with the requirements of this code.

3421.3 (IEBC 1302.1) Location on the lot. The building shall be located on the lot in accordance with the requirements of this code.

3421.4 (IEBC [B] 1302.2) Foundation. The foundation system of relocated buildings shall comply with this code.

3421.4.1 (IEBC [B] 1302.2.1) Connection to the foundation. The connection of the relocated building to the foundation shall comply with this code.

3421.5 (IEBC [B] 1302.3) Wind loads. Buildings shall comply with the wind provisions of this code.

Exceptions:

1. Detached one- and two-family dwellings and Group U occupancies where wind loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than 10 percent.

3421.6 (IEBC [B] 1302.4) Seismic loads. Buildings shall comply with seismic provisions of this code at the new location as applicable.

Exceptions:

1. Structures in Seismic Design Categories A and B and detached one- and two-family dwellings in Seismic Design Categories A, B and C where the seismic loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than 10 percent.

3421.7 (IEBC [B] 1302.5) Snow loads. Structures shall comply with snow loads of this code where snow loads at the new location are higher than those at the previous location.

Exception: Structural elements whose stress is not increased by more than 5 percent.

3421.8 (IEBC [B] 1302.6) Flood hazard areas. If relocated or moved into a *flood hazard area*, structures shall comply with Section 1612.

3421.9 (IEBC [B] 1302.7) Required inspection and repairs. The *building official* is authorized to inspect, or to require approved professionals to inspect at the expense of the owner, the various structural parts of a relocated building to verify that structural components and connections have not sustained structural damage. Any repairs required by the *building official* as a result of such inspection shall be made prior to the final approval.

SECTION K112 (IEBC SECTION 607)
REPAIRS

Electrical

K112.1 (IEBC 607.1) Repairs. Existing electrical wiring and equipment undergoing *repair* shall be allowed to be repaired or replaced with like material.

K112.1.1 (IEBC 607.1.1) Receptacles. Replacement of electrical receptacles shall comply with the applicable requirements of Section 406.3(D) of NFPA 70.

K112.1.2 (IEBC 607.1.2) Plug fuses. Plug fuses of the Edison-base type shall be used for replacements only where there is no evidence of over fusing or tampering per applicable requirements of Section 240.51(B) of NFPA 70.

K112.1.3 (IEBC 607.1.3) Nongrounding-type receptacles. For replacement of nongrounding-type receptacles with grounding type receptacles and for branch circuits that do not have an equipment grounding conductor in the branch circuitry, the grounding conductor of a grounding-type receptacle outlet shall be permitted to be grounded to any accessible point on the grounding electrode system or to any accessible point on the grounding electrode conductor in accordance with Section 250.130(C) of NFPA 70.

K112.1.4 (IEBC 607.1.4) Group I-2 receptacles. Non-“hospital grade” receptacles in patient bed locations of Group I-2 shall be replaced with “hospital grade” receptacles, as required by NFPA 99 and Article 517 of NFPA 70.

K112.1.5 (IEBC 607.1.5) Grounding of appliances. Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers and outlet or junction boxes that are part of the existing branch circuit for these appliances shall be permitted to be grounded to the grounded circuit conductor in accordance with Section 250.140 of NFPA 70.

SECTION K113 (IEBC SECTION 808)
LEVEL 2 ALTERATIONS

Electrical

K113.1 (IEBC 808.1) New installations. All newly installed electrical equipment and wiring relating to work done in any *work area* shall comply with the materials and methods requirements of Section 3415.

> **Exception:** Electrical equipment and wiring in newly installed partitions and ceilings shall comply with all applicable requirements of NFPA 70.

K113.2 (IEBC 808.2) Existing installations. Existing wiring in all work areas in Group A-1, A-2, A-5, H and I occupancies shall be upgraded to meet the materials and methods requirements of Section 3415.

K113.3 (IEBC 808.3) Residential occupancies. In Group R-2, R-3 and R-4 occupancies, the requirements of Sections K113.3.1 through K113.3.7 shall be applicable only to work areas located within a dwelling unit.

K113.3.1 (IEBC 808.3.1) Enclosed areas. All enclosed areas, other than closets, kitchens, basements, garages, hallways, laundry areas, utility areas, storage areas and bathrooms shall have a minimum of two duplex receptacle outlets or one duplex receptacle outlet and one ceiling or wall-type lighting outlet.

K113.3.2 (IEBC 808.3.2) Kitchens. Kitchen areas shall have a minimum of two duplex receptacle outlets.

K113.3.3 (IEBC 808.3.3) Laundry areas. Laundry areas shall have a minimum of one duplex receptacle outlet located near the laundry equipment and installed on an independent circuit.

K113.3.4 (IEBC 808.3.4) Ground fault circuit interruption. Newly installed receptacle outlets shall be provided with ground fault circuit interruption as required by NFPA 70.

K113.3.5 (IEBC 808.3.5) Minimum lighting outlets. At least one lighting outlet shall be provided in every bathroom, hallway, stairway, attached garage, and detached garage with electric power, and to illuminate outdoor entrances and exits.

K113.3.6 (IEBC 808.3.6) Utility rooms and basements. At least one lighting outlet shall be provided in utility rooms and basements where such spaces are used for storage or contain equipment requiring service.

K113.3.7 (IEBC 808.37) Clearance for equipment. Clearance for electrical service equipment shall be provided in accordance with the NFPA 70.

SECTION K114 (IEBC SECTION 1008)
CHANGE OF OCCUPANCY

Electrical

K114.1 (IEBC 1008.1) Special occupancies. Where the occupancy of an *existing building* or part of an *existing building* is changed to one of the following special occupancies as described in NFPA 70, the electrical wiring and equipment of the building or portion thereof that contains the proposed occupancy shall comply with the applicable requirements of NFPA 70 whether or not a *change of occupancy* group is involved:

1. Hazardous locations.
2. Commercial garages, *repair*, and storage.
3. Aircraft hangars.
4. Gasoline dispensing and service stations.
5. Bulk storage plants.
6. Spray application, dipping, and coating processes.
7. Health care facilities.
8. Places of assembly.
9. Theaters, audience areas of motion picture and television studios, and similar locations.
10. Motion picture and television studios and similar locations.
11. Motion picture projectors.
12. Agricultural buildings.

K114.2 (IEBC 1008.2) Unsafe conditions. Where the occupancy of an *existing building* or part of an *existing building* is changed, all unsafe conditions shall be corrected without requiring that all parts of the electrical system comply with NFPA 70.

K114.3 (IEBC 1008.3) Service upgrade. Where the occupancy of an *existing building* or part of an *existing building* is changed, electrical service shall be upgraded to meet the requirements of NFPA 70 for the new occupancy.

K114.4 (IEBC 1008.4) Number of electrical outlets. Where the occupancy of an *existing building* or part of an *existing building* is changed, the number of electrical outlets shall comply with NFPA 70 for the new occupancy.

Reason: This proposal copies the IEBC's work area compliance method into IBC Chapter 34, making the IBC's provisions for existing buildings complete. The IEBC has 3 methods of compliance for existing buildings— work area, prescriptive and performance. Two of these methods are copied directly from the IBC into the IEBC. The IBC, on the contrary, contains only 2 of the methods, lacking the work area method. This proposal copies the work area method into the IBC with no substantive changes to the IEBC provisions. They are merely copied into the IBC, with associated changes in numbering and other editorial and administrative revisions.

This proposal divides Chapter 34 into 4 parts. Part 1 is administrative, scoping and definitions—an arrangement similar to IBC Chapter 1. Part 1 includes existing Section 3401, 3402, and a new Section 3401.6, specifying that one of the 3 compliance methods must be chosen. Two new definitions from the IEBC are added—"change of occupancy" and "work area".

Part 2 includes existing Sections 3403 through 3411, which comprise the performance compliance method, the term used in the IEBC to describe this method. No changes to this compliance method are proposed.

Part 3 includes existing Section 3412, the performance compliance method, without any changes.

Part 4 is the work area method—each chapter of the IEBC is converted into a separate section.

The provisions of the IEBC work area method that are beyond the scope of the IBC are not included in this code change. For instance, this code change does not include provisions related to mechanical or plumbing systems, or energy conservation. The provisions related to electrical systems and equipment, however, are proposed to be added to IBC Appendix K.

The only change to the other IBC compliance methods is that new Section 3401.6.4 specifies seismic design and evaluation procedures that would apply to all compliance methods. It does not change what seismic design forces would be applied, but only specifies the procedures to be used in doing the design. Section 3401.6.4 specifies that either Chapter 16, ASCE 31 or ASCE 41 are to be the basis for seismic evaluations and design. Section 3401.6.4.1 clarifies how Chapter 16 is to be applied. These two changes will provide needed additional guidance for designers and code officials. Section 3401.6.4.2 specifies reduced seismic forces that can be used where the code specifically allows them. It is important to note that these reduced forces are only specifically allowed in the work area method.

Cost Impact: The code change proposal will not increase the cost of construction.

G202-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G203 – 12
202, 3401.1, 3410.1, 3410.2 (NEW); [IEBC (B0 401.1, 409.1, 409.2 (NEW)]

Proponent: Carl F. Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee (CTC)

Revise as follows:

RELOCATABLE BUILDING. A partially or completely assembled building constructed and designed to be reused multiple times and transported to different building sites.

3401.1 (IEBC [B] 401.1) Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* ~~and~~ change of occupancy, and the relocation of existing buildings and structures.

> **Exception:** Existing *bleachers*, grandstands and folding and telescopic seating shall comply with ICC 300.

3410.1 (IEBC [B] 409.1) Conformance. Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.

> **Exception:** Existing relocatable buildings moved into or within the jurisdiction shall be permitted to comply with the provisions of Chapter 13 of the International Existing Building Code.

3410.2 (IEBC [B] 401.2) Additions and Alterations. Additions and alterations made to relocatable buildings shall comply with the applicable provisions of Section 3403 and 3404 or the International Existing Building Code.

Reason: Unlike site-built buildings, which are typically intended to remain on their original site for the life of the building, relocatable modular buildings are designed and intended for relocation, reuse and/or repurposing. Many states have statutes that govern the building and relocating of relocatable modular buildings. For those that do not have state mandated requirements, much confusion and inconsistency exists about the requirements for relocatable modular buildings as existing buildings.

The Modular Building Institute (MBI) (www.modular.org) estimates that there are over 600,000 code compliant relocatable buildings in use in North America today. While it is impossible to determine the exact amount owned by the public at large, MBI estimates that public school districts across North America collectively own and operate about 180,000 relocatable classrooms with the industry owning and leasing an additional 120,000. Additionally, the industry owns and leases approximately 280,000 relocatable buildings for various other business occupancies, including construction site offices and temporary sales offices.

The Code Technology Committee Study Group on Relocatable Modular Buildings identified a number of unique characteristics of relocatable modular buildings that are unlike site-built buildings and compared them to the IBC and the IEBC. Their findings are as follows:

- There are provisions of the IBC that are not applicable/appropriate to relocatable modular buildings. Specifically, there is an unintended conflict between the IBC Section 3410, and the intent of the IEBC that cannot be realistically applied to relocatable modular buildings.
- There are sections of the conflicting code sections that cannot be applied to both site-built and relocatable modular buildings, specifically related to construction documents, inspection, and relocation.

Both the IBC and the IEBC are unclear on how to treat these buildings, particularly when they are relocated to a new site. In the absence of clear definitions and requirements that are specific to both new and existing relocatable modular buildings, many code officials attempt to apply similar, but non-related sections of the building code intended for site built buildings to the relocatable modular industry. There are unique attributes to relocatable modular buildings that warrant their own requirements in a new chapter in this code.

CTC has submitted two proposals on the subject of relocatable modular buildings. One proposal to Section 3112 for new construction and this proposal for existing buildings which are relocated. This proposal includes:

- The definition has been distilled from industry publications and definitions found in state statutes that govern modular (industrialized) buildings. This definition was also approved in the 2012 IGCC.
- An exception to IBC 3410 for relocatable buildings (currently treats all moved buildings as “new” buildings) with a pointer to Chapter 13 of IEBC. Moved relocatable modular buildings are to be treated as existing buildings.
- Relocatables undergoing additions or alterations shall comply with the appropriate section of the IEBC, which also applies to site built buildings. This section clarifies that there is no difference between the requirements for modular buildings and site built buildings when either undergoes construction for alteration or addition.

Moving this document forward through the ICC code development process will help the modular building industry comply with the intent of the code, provide a clear and consistent path for enforcement professionals, and for compliance by owners of relocatable buildings who wish to re-use or repurpose their existing buildings.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: This code change proposal will not increase the cost of construction.

G203-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-RELOCATABLE BUILDING-G-BALDASSARRA-CTC

G204 – 12
3401.1

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

Revise as follows:

3401.1 Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition*, moving, and change of occupancy of existing buildings and structures.

> **Exception:** Existing *bleachers*, grandstands and folding and telescopic seating shall comply with ICC 300.

Reason: Chapter 34 includes Section 3410 for Moved Structures.

Cost Impact: The proposed changes will not increase the cost of construction.

G204-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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G205 – 12

Part I
3401.1.2 (NEW)
Part II
3401.3, 3401.1.3 through 3401.3.4 (NEW),
Part III
3401.5 (NEW), 3403.2, 3404.2, 3505.5 (IEBC [B] 402.2, 403.2, 404.5)
Part IV
3401.6
Part V
3401.6 (New)
Part VI
3406, 3407, 3411 (IEBC [B] 405,406, 410)
Part VII
3403 (IEBC [B] 402)
Part VIII
3404 (IEBC [B] 403)
Part IX
3405 (IEBC [B] 404)
Part X
202 (New)
Part XI
3408, 3409, 3410 (IEBC [B] 407, 408, 409)
Part XII
3404.1 (NEW) through 3412.1.8 (NEW)

Proponent: David S. Collins, The Preview Group, Inc., representing The American Institute of Architects

THIS IS A 12 PART CODE CHANGE PROPOSAL. ALL 12 PARTS OF THE PROPOSAL WILL BE HEARD BY THE IBC GENERAL COMMITTEE.

PART I – IBC GENERAL

Add new text as follows:

3401.1 Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and change of occupancy of existing buildings and structures.

> **Exception:** Existing *bleachers*, grandstands and folding and telescopic seating shall comply with ICC 300.

<u>**3401.1.2 Intent.** The intent of this code is to provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition and relocation of existing buildings.</u>

PART II – IBC GENERAL

Revise as follows:

~~**3401.3 Compliance.** *Alterations*, *repairs*, *additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in the *International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code, International Residential Code* and NFPA 70. Where provisions of the other codes conflict with provisions of this Chapter, the provisions of this Chapter shall take precedence~~.

3401.3 Compliance. The repair, alteration, change of occupancy, addition or relocation of all existing buildings shall comply with the applicable provisions of Section 3401 and one of the methods listed in Sections 3401.3.2 through 3401.3.4. Application of a method shall be the sole basis for assessing the compliance of work performed under a single permit unless otherwise approved by the code official. Sections 3401.3.2 through 3401.3.4 shall not be applied in combination with each other.

3401.3.1 Compliance with laws at the time the building was constructed. Subject to the approval of the code official, alterations complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural alteration as prescribed in Section 907.4.3. New structural members added as part of the alteration shall comply with the International Building Code. Alterations of existing buildings in flood hazard areas shall comply with Section 3401.5.

3401.3.2 Prescriptive compliance method. Repairs, alterations, additions and changes of occupancy complying with Section 3403 of this code in buildings complying with the International Fire Code.

3401.3.3 Work area compliance method. Repairs, alterations, additions, changes in occupancy and relocated buildings complying with the applicable requirements of Sections 3404 to 3412 of this code.

3401.3.4 Performance compliance method. Repairs, alterations, additions, changes in occupancy and relocated buildings complying with Section 3413 of this code.

PART III – IBC GENERAL

Revise as follows:

3401.5 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repairs, alterations and additions that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in flood hazard areas established in Section 1612.3, any additions that do not constitute substantial improvement of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

The code official shall not grant modifications to provisions related to flood resistance unless a determination is made that:

1. The applicant has presented good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render compliance with the flood-resistant construction provisions inappropriate.
2. Failure to grant the modification would result in exceptional hardship.

3. The granting of the modification will not result in increased flood heights, additional threats to public safety, extraordinary public expense nor create nuisances, cause fraud on or victimization of the public or conflict with existing laws or ordinances.
4. The modification is the minimum necessary to afford relief, considering the flood hazard.
5. A written notice will be provided to the applicant specifying, if applicable, the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation and that construction below the design flood elevation increases risks to life and property.

~~**3403.2 (IEBC [B] 402.2) Flood hazard areas.** For buildings and structures in *flood hazard areas* established in Section 1612.3, any *addition* that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.~~

~~For buildings and structures in *flood hazard areas* established in Section 1612.3, any additions that do not constitute substantial improvement of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.~~

~~**3404.2 (IEBC [B] 403.2) Flood hazard areas.** For buildings and structures in *flood hazard areas* established in Section 1612.3, any *alteration* that constitutes *substantial improvement* of the *existing structure*, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the *existing structure* shall be brought into compliance with the requirements for new construction for flood design.~~

~~For buildings and structures in *flood hazard areas* established in Section 1612.3, any *alterations* that do not constitute *substantial improvement* of the *existing structure*, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.~~

~~**3405.5 (IEBC [B] 404.5) Flood hazard areas.** For buildings and structures in *flood hazard areas* established in Section 1612.3, any *repair* that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.~~

~~For buildings and structures in *flood hazard areas* established in Section 1612.3, any *repairs* that do not constitute substantial improvement or repair of substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.~~

PART IV – IBC GENERAL

Delete without substitution:

~~**3401.6 Alternative compliance.** Work performed in accordance with the *International Existing Building Code* shall be deemed to comply with the provisions of this chapter.~~

PART V – IBC GENERAL

Add new text as follows:

3401.6 Structural requirements. Where this chapter requires consideration of the structural system of an existing building subject to repair, alteration, change of occupancy, addition or relocation of existing buildings, the structure shall be made to comply with this section. (IEBC 301.1)

3401.6.1 New structural elements. New structural elements in alterations, including connections and anchorage, shall comply with the International Building Code.

3401.6.2 Minimum design loads. The minimum design loads on existing elements of a structure that do not support additional loads as a result of an alteration shall be the loads applicable at the time the building was constructed.

3401.6.3 Existing structural elements carrying gravity loads. Alterations shall not reduce the capacity of existing gravity load-carrying structural elements unless it is demonstrated that the elements have the capacity to carry the applicable design gravity loads required in Chapter 16. Existing structural elements supporting any additional gravity loads as a result of the alterations, including the effects of snow drift, shall comply with the International Building Code. (IBC 3404.3, IEBC 807.4)

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the existing building and its alteration comply with the conventional light-frame construction methods of the International Building Code or the provisions of the International Residential Code.

3401.6.4 Existing structural elements resisting lateral loads. Additions or alterations affecting existing structural elements resisting lateral loads shall comply with this section. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R , W0, and Cd for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

3401.6.4.1 Additions. Where an addition is structurally independent of the existing structure, existing lateral load-carrying structural elements shall be permitted to remain unaltered. Where the addition is not structurally independent of the existing structure, the existing structure and its addition acting together as a single structure shall be shown to meet the requirements of Sections 1609 and 1613.

Exception: Any existing lateral load-carrying structural element whose demand-capacity ratio with the addition considered is no more than 10 percent greater than its demand-capacity ratio with the addition ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of additions and alterations since original construction.

3401.6.4.2 Alterations. Alterations affecting the demands or capacities of existing elements of the lateral load-resisting system shall be evaluated using the wind provisions in Section 1609 and the reduced IBC-level seismic forces per Section 1604.10. Any existing lateral load-resisting structural elements whose demand-capacity ratio with the alteration considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be brought into compliance with those wind and seismic provisions. In addition, the alteration shall not create a structural irregularity prohibited by ASCE 7 unless the entire structure complies with Section 3401.4.5.5. For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of additions and alterations since the original construction. (3403.4 IBC, 807.5 IEBC)

3401.6.4.3 Voluntary lateral force-resisting system alterations. Alterations of existing structural elements and additions of new structural elements that are initiated for the purpose of increasing the lateral force-resisting strength or stiffness of an existing structure and that are not required by other sections of this code shall not be required to be designed for forces conforming to the International Building Code, provided that an engineering analysis is submitted including all of the following:

1 The capacity of existing structural elements required to resist forces is not reduced;
2 The lateral loading to existing structural elements is not increased either beyond its capacity or more than 10 percent;
3 New structural elements are detailed and connected to the existing structural elements as required by the International Building Code;
4 New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the International Building Code; and
5 A dangerous condition as defined in this code is not created. Voluntary alterations to lateral force-resisting systems conducted in accordance with Appendix A and the referenced standards of this code shall be permitted. (IBC 3404.5, IEBC 807.6)

3401.6.4.4 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced International Building Code seismic force levels, the procedures used shall be in accordance with one of the following:

1. The International Building Code using 75 percent of the prescribed forces. Values of R, W0 and Cd used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix A Chapters shall be deemed to comply with this section.
   - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
   - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
   - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
   - 2.5. Seismic evaluation and design of concrete buildings in all risk categories are permitted to be based on the procedures specified in Chapter A5.
3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 3401.1.4.5.5. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 3401.6.4.4. The design spectral response acceleration parameters SXS and SX1 specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters SDS and SD1 defined by the International Building Code.

(IEBC Table 301.1.4.2)

TABLE 3401.6.4.4 (IEBC TABLE 301.1.4.2)
PERFORMANCE CRITERIA FOR REDUCED CHAPTER 16-LEVEL SEISMIC FORCES OCCUPANCY

RISK CATEGORY (Based on IBC Table 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 31	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Life safety (LS)
II	Life safety (LS)	Life safety (LS)
III	Notes a, b	Note a
IV	Immediate occupancy (IO)	Life safety (LS)

a. Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance levels, but need not be less than the acceptance criteria specified for Risk Category IV levels.
b. For Risk Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.
a. Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance levels, but need not be less than the acceptance criteria specified for Risk Category IV levels.
b. For Risk Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.
(IBC 3401.4.3, IEBC 301.1.4.2)

PART VI – IBC GENERAL

Revise as follows:

~~SECTION 3411 (IEBC [B] 410)~~
~~ACCESSIBILITY FOR EXISTING BUILDINGS~~

3401.7 Accessibility for existing buildings. Accessibility for existing buildings shall be in accordance with Sections 3401.7.1 through 3401.7.9.4.

~~3411.1(IEBC [B] 410.1)~~ 3401.7.1 Scope. The provisions of Sections ~~3411.1 through 3411.9~~ 3401.7.1 through 3401.7.9 apply to maintenance, change of occupancy, additions and alterations to existing buildings, including those identified as historic buildings.

~~3411.2 (IEBC [B] 410.2)~~ 3401.7.2 Maintenance of facilities. A facility that is constructed or altered to be accessible shall be maintained accessible during occupancy.

~~3411.3 (IEBC [B] 410.3)~~ 3401.7.3 Extent of application. An alteration of an existing facility shall not impose a requirement for greater accessibility than that which would be required for new construction. Alterations shall not reduce or have the effect of reducing accessibility of a facility or portion of a facility.

~~3411.4 (IEBC [B] 410.4)~~ 3401.7.4 Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section.

> **Exception:** Type B dwelling units or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.

~~3411.4.1 (IEBC [B] 410.4.1)~~ 3401.7.4.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 3401.7.6, 3401.7.7 and 3401.7.8.

~~3411.4.2 (IEBC [B] 410.4.2)~~ 3401.7.4.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3401.7.4.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is being provided.
5. At least one accessible passenger loading zone, when loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Exception: The accessible features listed in Items 1 through 6 are not required for an accessible route to Type B units.

~~**3411.5(IEBC [B] 410.5)**~~ **3401.7.5 Additions.** Provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, a primary function shall comply with the requirements in Section 3401.7.7.

~~**3411.6(IEBC [B] 410.6)**~~ **3401.7.6 Alterations.** A facility that is altered shall comply with the applicable provisions in Chapter 11 of this code, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3401.7.7.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall be permitted to meet the provision for a Type B dwelling unit.
4. Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.

~~**3411.7(IEBC [B] 410.7)**~~ **3401.7.7 Alterations affecting an area containing a primary function.** Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of a facility.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

~~**3411.8 (IEBC [B] 410.8)**~~ **3401.7.8 Scoping for alterations.** The provisions of Sections 3401.7.8.1 through 3401.7.8.14 shall apply to alterations to existing buildings and facilities.

~~**3411.8.1 (IEBC [B] 410.8.1)**~~ **3401.7.8.1 Entrances.** Accessible entrances shall be provided in accordance with Section 1105.

Exception: Where an alteration includes alterations to an entrance, and the facility has an accessible entrance, the altered entrance is not required to be accessible, unless required by Section 3401.7.7. Signs complying with Section 1110 shall be provided.

~~**3411.8.2 (IEBC [B] 410.8.2)**~~ **3401.7.8.2 Elevators.** Altered elements of existing elevators shall comply with ASME A17.1 and ICC A117.1. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator.

~~3411.8.3 (IEBC [B] 410.8.3)~~ **3401.7.8.3 Platform lifts.** Platform (wheelchair) lifts complying with ICC A117.1 and installed in accordance with ASME A18.1 shall be permitted as a component of an accessible route.

~~3411.8.4 (IEBC [B] 410.8.4)~~ **3401.7.8.4 Stairs and escalators in existing buildings.** In alterations, change of occupancy or additions where an escalator or stair is added where none existed previously and major structural modifications are necessary for installation, an accessible route shall be provided between the levels served by the escalator or stairs in accordance with Sections 1104.4 and 1104.5.

~~3411.8.5 (IEBC [B] 410.8.5)~~ **3401.7.8.5 Ramps.** Where slopes steeper than allowed by Section 1010.2 are necessitated by space limitations, the slope of ramps in or providing access to existing facilities shall comply with Table 3401.7.8.5.

TABLE ~~3411.8.5~~ 3401.7.8.5
RAMPS

SLOPE	MAXIMUM RISE
Steeper than 1:10 but not steeper than 1:8	3 inches
Steeper than 1:12 but not steeper than 1:10	6 inches

For SI: 1 inch = 25.4 mm.

~~3411.8.6 (IEBC [B] 410.8.6)~~ **3401.7.8.6 Performance areas.** Where it is technically infeasible to alter performance areas to be on an accessible route, at least one of each type of performance area shall be made accessible.

~~3411.8.7 (IEBC [B] 410.8.7)~~ **3401.7.8.7 Accessible dwelling or sleeping units.** Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible units apply only to the quantity of spaces being altered or added.

~~3411.8.8 (IEBC [B] 410.8.8)~~ **3401.7.8.8 Type A dwelling or sleeping units.** Where more than 20 Group R-2 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Type A units apply only to the quantity of the spaces being altered or added.

~~3411.8.9 (IEBC [B] 410.8.9)~~ **3401.7.8.9 Type B dwelling or sleeping units.** Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for Type B units apply only to the quantity of the spaces being added. Where Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered and where the work area is greater than 50 percent of the aggregate area of the building, the requirements of Section 1107 for Type B units apply only to the quantity of the spaces being altered.

~~3411.8.10 (IEBC [B] 410.8.10)~~ **3401.7.8.10 Jury boxes and witness stands.** In alterations, accessible wheelchair spaces are not required to be located within the defined area of raised jury boxes or witness stands and shall be permitted to be located outside these spaces where the ramp or lift access restricts or projects into the means of egress.

~~3411.8.11 (IEBC [B] 410.8.11)~~ **3401.7.8.11 Toilet rooms.** Where it is technically infeasible to alter existing toilet and bathing rooms to be accessible, an accessible family or assisted-use toilet or bathing room constructed in accordance with Section 1109.2.1 is permitted. The family or assisted-use toilet or bathing room shall be located on the same floor and in the same area as the existing toilet or bathing rooms.

~~3411.8.12 (IEBC [B] 410.8.12)~~ **3401.7.8.12 Dressing, fitting and locker rooms.** Where it is technically infeasible to provide accessible dressing, fitting or locker rooms at the same location as similar types of rooms, one accessible room on the same level shall be provided. Where separate-sex facilities are provided, accessible rooms for each sex shall be provided. Separate-sex facilities are not required where only unisex rooms are provided.

~~3411.8.13~~ **~~(IEBC [B] 410.8.13)~~** **3401.7.8.13 Fuel dispensers.** Operable parts of replacement fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

~~3411.8.14~~ **~~(IEBC [B] 410.8.14)~~** **3401.7.8.14 Thresholds.** The maximum height of thresholds at doorways shall be 3/4 inch (19.1 mm). Such thresholds shall have beveled edges on each side.

~~3411.9~~ **~~(IEBC [B] 410.9)~~** **3401.7.9 Historic buildings.** These provisions shall apply to facilities designated as historic structures that undergo alterations or a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, entrances or toilet rooms would threaten or destroy the historic significance of the facility, as determined by the applicable governing authority, the alternative requirements of Sections 3401.7.9.1 through 3401.7.9.4 for that element shall be permitted.

> **Exception:** Type B dwelling or sleeping units required by Section 1107 are not required to be provided in historical buildings.

~~3411.9.1~~ **~~(IEBC [B] 410.9.1)~~** **3401.7.9.1 Site arrival points.** At least one accessible route from a site arrival point to an accessible entrance shall be provided.

~~3411.9.2(IEBC [B] 410.9.2)~~ **3401.7.9.2 Multilevel buildings and facilities.** An accessible route from an accessible entrance to public spaces on the level of the accessible entrance shall be provided.

~~3411.9.3(IEBC [B] 410.9.3)~~ **3401.7.9.3 Entrances.** At least one main entrance shall be accessible.

Exceptions:

1. If a main entrance cannot be made accessible, an accessible nonpublic entrance that is unlocked while the building is occupied shall be provided; or
2. If a main entrance cannot be made accessible, a locked accessible entrance with a notification system or remote monitoring shall be provided.

Signs complying with Section 1110 shall be provided at the primary entrance and the accessible entrance.

~~3411.9.4 (IEBC [B] 410.9.4)~~ **3401.7.9.4 Toilet and bathing facilities.** Where toilet rooms are provided, at least one accessible family or assisted-use toilet room complying with Section 1109.2.1 shall be provided.

~~SECTION 3406(IEBC [B] 405)~~
~~FIRE ESCAPES~~

~~3406.1~~ **~~(IEBC [B] 405.1)~~** **3401.8.1 Fire escapes ~~Where permitted~~.** Fire escapes shall be permitted only as provided for in Sections 3401.8.1.1 through 3401.8.1.4.

~~3406.1.1(IEBC [B] 405.1.1)~~ **3401.8.1.1 New buildings.** Fire escapes shall not constitute any part of the required means of egress in new buildings.

~~3406.1.2~~ **~~(IEBC [B] 405.1.2)~~** **3401.8.1.2 Existing fire escapes.** Existing fire escapes shall be continued to be accepted as a component in the means of egress in existing buildings only.

~~3406.1.3 (IEBC [B] 405.1.3)~~ **3401.8.1.3 New fire escapes.** New fire escapes for existing buildings shall be permitted only where exterior stairs cannot be utilized due to lot lines limiting stair size or due to the sidewalks, alleys or roads at grade level. New fire escapes shall not incorporate ladders or access by windows.

~~3406.1.4 (IEBC [B] 405.1.4)~~ 3401.8.1.4 Limitations. Fire escapes shall comply with this section and shall not constitute more than 50 percent of the required number of exits nor more than 50 percent of the required exit capacity.

~~3406.2 (IEBC [B] 405.2)~~ 3401.8.2 Location. Where located on the front of the building and where projecting beyond the building line, the lowest landing shall not be less than 7 feet (2134 mm) or more than 12 feet (3658 mm) above grade, and shall be equipped with a counterbalanced stairway to the street. In alleyways and thoroughfares less than 30 feet (9144 mm) wide, the clearance under the lowest landing shall not be less than 12 feet (3658 mm).

~~3406.3 (IEBC [B] 405.3)~~ 3401.8.3 Construction. The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of steel or other approved noncombustible materials. Fire escapes constructed of wood not less than nominal 2 inches (51 mm) thick are permitted on buildings of Type V construction. Walkways and railings located over or supported by combustible roofs in buildings of Type III and IV construction are permitted to be of wood not less than nominal 2 inches (51 mm) thick.

~~3406.4 (IEBC [B] 405.4)~~ 3401.8.4 Dimensions. Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm) and landings at the foot of stairs not less than 40 inches (1016 mm) wide by 36 inches (914 mm) long, located not more than 8 inches (203 mm) below the door.

~~3406.5 (IEBC [B] 405.5)~~ 3401.8.5 Opening protectives. Doors and windows along the fire escape shall be protected with ¾-hour opening protectives.

~~SECTION 3407 (IEBC [B] 406)~~
~~GLASS REPLACEMENT~~

~~3407.1(IEBC [B] 406.1)~~ 3401.9 Glass Replacement. The installation or replacement of glass shall be as required for new installations.

PART VII- IBC GENERAL

Revise as follows:

~~SECTION 3403(IEBC [B] 402)~~
~~ADDITIONS~~

3403.1 Prescriptive Compliance. The provisions of this section control the alteration, repair, addition and change of occupancy or relocation of existing buildings and structures, including historic buildings and structures when using the prescriptive compliance method as permitted in Section 3401.3.3.

~~3403.1 (IEBC [B] 402.1) General~~ 3403.1.1 Additions. *Additions* to any building or structure shall comply with the requirements of this code for new construction. *Alterations* to the existing building or structure shall be made to ensure that the existing building or structure together with the *addition* are no less conforming with the provisions of this code than the existing building or structure was prior to the *addition*. An existing building together with its *additions* shall comply with the height and area provisions of Chapter 5.

~~**3403.3 (IEBC [B] 402.3) Existing structural elements carrying gravity load.** Any existing gravity load-carrying structural element for which an *addition* and its related alterations cause an increase in design gravity load of more than 5 percent shall be strengthened, supplemented, replaced or otherwise altered as needed to carry the increased gravity load required by this code for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased shall be considered an altered element subject to the requirements of Section 3404.3. Any existing element~~

~~that will form part of the lateral load path for any part of the *addition* shall be considered an existing lateral load-carrying structural element subject to the requirements of Section 3403.4.~~

~~**3403.3.1 (IEBC [B] 402.3.3.1) Design live load.** Where the *addition* does not result in increased design live load, existing gravity loadcarrying structural elements shall be permitted to be evaluated and designed for live loads *approved* prior to the *addition*. If the *approved* live load is less than that required by Section 1607, the area designed for the nonconforming live load shall be posted with placards of *approved* design indicating the *approved* live load. Where the *addition* does result in increased design live load, the live load required by Section 1607 shall be used.~~

~~**3403.4 (IEBC [B] 402.3.4) Existing structural elements carrying lateral load.** Where the *addition* is structurally independent of the *existing structure*, existing lateral load-carrying structural elements shall be permitted to remain unaltered. Where the *addition* is not structurally independent of the *existing structure*, the *existing structure* and its *addition* acting together as a single structure shall be shown to meet the requirements of Sections 1609 and 1613.~~

> ~~**Exception:** Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is no more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.~~

~~3403.5 (IEBC [B] 402.5)~~ <u>3403.1.1.1</u> Smoke alarms in existing portions of a building. Where an *addition* is made to a building or structure of a Group R or I-1 occupancy, the existing building shall be provided with *smoke alarms* in accordance with Section 1103.8 of the *International Fire Code*.

PART VIII - IBC GENERAL

Revise as follows:

~~SECTION 3404 (IEBC [B] 403)~~
~~ALTERATIONS~~

~~3404.1 (IEBC [B] 403.1)~~ <u>3403.1.2</u> ~~General~~ <u>Alterations</u>. Except as provided by Section 3401.4 or this section, *alterations* to any building or structure shall comply with the requirements of the code for new construction. *Alterations* shall be such that the existing building or structure is no less complying with the provisions of this code than the existing building or structure was prior to the *alteration*.

Exceptions:

1. An existing *stairway* shall not be required to comply with the requirements of Section 1009 where the existing space and construction does not allow a reduction in pitch or slope.
2. *Handrails* otherwise required to comply with Section 1009.15 shall not be required to comply with the requirements of Section 1012.6 regarding full extension of the *handrails* where such extensions would be hazardous due to plan configuration.

~~**3404.3 (IEBC [B] 403.3) Existing structural elements carrying gravity load.** Any existing gravity load-carrying structural element for which an *alteration* causes an increase in design gravity load of more than 5 percent shall be strengthened, supplemented, replaced or otherwise altered as needed to carry the increased gravity load required by this code for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the *alteration* shall be~~

~~shown to have the capacity to resist the applicable design gravity loads required by this code for new structures.~~

~~**3404.3.1 (IEBC [B] 403.3.1) Design live load.** Where the *alteration* does not result in increased design live load, existing gravity load carrying structural elements shall be permitted to be evaluated and designed for live loads *approved* prior to the *alteration*. If the *approved* live load is less than that required by Section 1607, the area designed for the nonconforming live load shall be posted with placards of *approved* design indicating the *approved* live load. Where the *alteration* does result in increased design live load, the live load required by Section 1607 shall be used.~~

~~**3404.4 (IEBC [B] 403.4) Existing structural elements carrying lateral load.** Except as permitted by Section 3404.5, where the *alteration* increases design lateral loads in accordance with Section 1609 or 1613, or where the *alteration* results in a structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the requirements of Sections 1609 and 1613.~~

> ~~**Exception:** Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is no more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.~~

~~**3404.5 (IEBC [B] 403.5) Voluntary seismic improvements.** *Alterations* to existing structural elements or additions of new structural elements that are not otherwise required by this chapter and are initiated for the purpose of improving the performance of the seismic force-resisting system of an *existing structure* or the performance of seismic bracing or anchorage of existing nonstructural elements shall be permitted, provided that an engineering analysis is submitted demonstrating the following:~~

1. ~~The altered structure and the altered nonstructural elements are no less conforming with the provisions of this code with respect to earthquake design than they were prior to the alteration.~~
2. ~~New structural elements are detailed as required for new construction.~~
3. ~~New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required for new construction.~~
4. ~~The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.~~

~~**3404.6 (IEBC [B] 403.6)**~~ **<u>3403.1.2.1</u> Smoke alarms.** Individual *sleeping units* and individual *dwelling units* in Group R and I-1 occupancies shall be provided with *smoke alarms* in accordance with Section 1103.8 of the *International Fire Code*.

PART IX - IBC GENERAL

Revise as follows:

~~SECTION 3405 (IEBC [B] 404)~~
~~REPAIRS~~

<u>**3403.1.3 Repairs.** Repairs to existing buildings shall be in accordance with Sections 3403.1.3 through 3403.1.</u>

~~**3405.1(IEBC [B] 404.1)**~~ **<u>3403.1.3.1</u> General<u>.</u>** Buildings and structures, and parts thereof, shall be repaired in compliance with Section 3403.1.3.1 and 3401.2. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by

Section 3401.2, ordinary repairs exempt from *permit* in accordance with Section 105.2, and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

~~3405.2 (IEBC [B] 404.2)~~ 3403.1.3.2 Substantial structural damage to vertical elements of the lateral-force-resisting system. A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3403.1.3.2.1 through 3403.1.3.2.3.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose *substantial structural damage* was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

~~3405.2.1 (IEBC [B] 404.2.1)~~ 3403.1.3.2.1 Evaluation. The building shall be evaluated by a *registered design professional*, and the evaluation findings shall be submitted to the *building official*. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads. Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be 75 percent of those prescribed in Section 1613.

~~3405.2.2(IEBC [B] 404.2.2)~~ 3403.1.3.2.2 Extent of repair for compliant buildings. If the evaluation establishes compliance of the pre-damage building in accordance with Section 3403.1.3.2.1, then repairs shall be permitted that restore the building to its pre-damage state, based on material properties and design strengths applicable at the time of original construction.

~~3405.2.3 (IEBC [B] 404.2.3)~~ 3403.1.3.2.3 Extent of repair for noncompliant buildings. If the evaluation does not establish compliance of the predamage building in accordance with Section 3403.1.3.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations that include wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by this code. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

~~3405.3 (IEBC [B] 404.3)~~ 3403.1.3.3 Substantial structural damage to gravity load-carrying components. Gravity load-carrying components that have sustained *substantial structural damage* shall be rehabilitated to comply with the applicable provisions of this code for dead and live loads. Snow loads shall be considered if the *substantial structural damage* was caused by or related to snow load effects. Existing gravity load-carrying structural elements shall be permitted to be designed for live loads *approved* prior to the damage. Nondamaged gravity load-carrying components that receive dead, live or snow loads from rehabilitated components shall also be rehabilitated or shown to have the capacity to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

~~3405.3.1 (IEBC [B] 404.3.1)~~ 3403.1.3.3.1 Lateral force-resisting elements. Regardless of the level of damage to vertical elements of the lateral force-resisting system, if *substantial structural damage* to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3403.1.3.2.1 and, if noncompliant, rehabilitated in accordance with Section 3403.1.3.2.3.

Exceptions:

1. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. Buildings assigned to Seismic Design Category A, B, or C whose *substantial structural damage* was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.

~~3405.4 (IEBC [B] 404.4)~~ 3403.1.3.4 Less than substantial structural damage. For damage less than *substantial structural damage*, *repairs* shall be allowed that restore the building to its pre-damage state, based on material properties and design strengths applicable at the time of original construction. New structural members and connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

PART X – IBC GENERAL

Add new definitions as follows:

SECTION 202
DEFINITIONS

CHANGE OF OCCUPANCY. A change in the purpose or level of activity within a building that involves a change in application of the requirements of this code.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services. Equipment or fixture shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

LOAD-BEARING ELEMENT. Any column, girder, beam, joist, truss, rafter, wall, floor or roof sheathing that supports any vertical load in addition to its own weight or any lateral load.

NONCOMBUSTIBLE MATERIAL. A material that, under the conditions anticipated, will not ignite or burn when subjected to fire or heat. Materials that pass ASTM E 136 are considered noncombustible materials.

REHABILITATION. Any work, as described by the categories of work defined herein, undertaken in an existing building.

REHABILITATION, SEISMIC. Work conducted to improve the seismic lateral force resistance of an existing building.

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

SEISMIC LOADING. The forces prescribed herein, related to the response of the structure to earthquake motions, to be used in the analysis and design of the structure and its components.

UNSAFE. Buildings, structures or equipment that are unsanitary, or that are deficient due to inadequate means of egress facilities, inadequate light and ventilation, or that constitute a fire hazard, or in which the structure or individual structural members meet the definition of “Dangerous,” or that are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance shall be deemed unsafe. A vacant structure that is not secured against entry shall be deemed unsafe.

WORK AREA. That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.

PART XI – IBC GENERAL

Revise as follows:

~~SECTION 3408 (IEBC [B] 407)~~
~~CHANGE OF OCCUPANCY~~

3403.6 Change of occupancy. Change of occupancy shall be in accordance with Sections 3403.6.1 through 3403.6.4

~~3408.1 (IEBC [B] 407.1)~~ 3403.6.1 Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancies or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division
or group of occupancies. Subject to the approval of the *building official*, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

~~3408.2 (IEBC [B] 407.2)~~ 3403.6.2 Certificate of occupancy. A certificate of occupancy shall be issued where it has been determined that the requirements for the new occupancy classification have been met.

~~3408.3 (IEBC [B] 407.3)~~ 3403.6.3 Stairways. An existing stairway shall not be required to comply with the requirements of Section 1009 where the existing space and construction does not allow a reduction in pitch or slope.

~~3408.4 (IEBC [B] 407.4)~~ 3403.6.4 Seismic. When a change of occupancy results in a structure being reclassified to a higher risk category, the structure shall conform to the seismic requirements for a new structure of the higher risk category.

Exceptions:

1. Specific seismic detailing requirements of Section 1613 for a new structure shall not be required to be met where the seismic performance is shown to be equivalent to that of a new structure. A demonstration of equivalence shall consider the regularity, overstrength, redundancy and ductility of the structure.
2. When a change of use results in a structure being reclassified from Risk Category I or II to Risk Category III and the structure is located where the seismic coefficient, *SDS,* is less than 0.33, compliance with the seismic requirements of Section 1613 are not required.

~~SECTION 3409 (IEBC [B] 408)~~
~~HISTORIC BUILDINGS~~

3403.7 Historic Buildings. Historic buildings shall be in accordance with Sections 3403.7.1 and 3403.7.2

~~3409.1 (IEBC [B] 408.1)~~ 3403.7.1 ~~Historic buildings~~ General. The provisions of this code relating to the construction, *repair*, *alteration*, *addition*, restoration and movement of structures, and change of occupancy shall not be mandatory for *historic buildings* where such buildings are judged by the *building official* to not constitute
a distinct life safety hazard.

~~**3409.2 (IEBC [B] 408.2)**~~ **3403.7.2 Flood hazard areas.** Within *flood hazard areas* established in accordance with Section 1612.3, where the work proposed constitutes *substantial improvement* as defined in Section 1612.2, the building shall be brought into compliance with Section 1612.

Exception: *Historic buildings* that are:

1. *Listed* or preliminarily determined to be eligible for listing in the National Register of Historic Places;
2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
3. Designated as historic under a state or local historic preservation program that is *approved* by the Department of Interior.

~~**SECTION 3410 (IEBC [B] 409)**~~
~~**MOVED STRUCTURES**~~

~~**3410.1 (IEBC [B] 409.1)**~~ **3403.8** ~~**Conformance**~~ **Moved structures.** Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.

PART XII - IBC GENERAL

Add new text as follows

SECTION 3404
WORK AREA METHOD.

3404.1 Work area compliance. The provisions of this section and Sections 3405 through 3412 control the alteration, repair, addition and change of occupancy or relocation of existing buildings and structures, including historic buildings and structures when using the work area compliance method as permitted in Section 3401.3.3.

3404.1.1 Work area. The work area, as defined in Chapter 2, shall be identified on the construction documents.

3404.1.2 Occupancy and use. When determining the appropriate application of the referenced sections of this code, the occupancy and use of a building shall be determined in accordance with Section 3401.3 of the International Building Code.

SECTION 3405
REPAIRS

3405.1 General. Repairs within the work area shall comply with the applicable requirements of Section 3403.1.3 for repairs. The work shall not make the building less conforming than it was before the repair was undertaken.

3405.1.1 Structural. Structural repairs shall be in compliance with this section and Section 3403.1.3. Repairs to damaged buildings shall comply with this section.

3405.1.2 Flood hazard areas. In flood hazard areas, buildings that have sustained substantial damage shall be brought into compliance with Section 3401.5.

3405.1.3 Electrical. Existing electrical wiring and equipment undergoing repair shall be allowed to be repaired or replaced with like material as required by this section.

3405.1.3.1 Receptacles. Replacement of electrical receptacles shall comply with the applicable requirements of Section 406.3(D) of NFPA 70.

3405.1.3.2 Plug fuses. Plug fuses of the Edison-base type shall be used for replacements only where there is no evidence of over fusing or tampering per applicable requirements of Section 240.51(B) of NFPA 70.

3405.1.3.3 Nongrounding-type receptacles. For replacement of nongrounding-type receptacles with grounding-type receptacles and for branch circuits that do not have an equipment grounding conductor in the branch circuitry, the grounding conductor of a grounding-type receptacle outlet shall be permitted to be grounded to any accessible point on the grounding electrode system or to any accessible point on the grounding electrode conductor in accordance with Section 250.130(C) of NFPA 70.

3405.1.3.4 Group I-2 receptacles. Non-“hospital grade” receptacles in patient bed locations of Group I-2 shall be replaced with “hospital grade” receptacles, as required by NFPA 99 and Article 517 of NFPA 70.

3405.1.3.5 Grounding of appliances. Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers and outlet or junction boxes that are part of the existing branch circuit for these appliances shall be permitted to be grounded to the grounded circuit conductor in accordance with Section 250.140 of NFPA 70.

3405.1.4 Mechanical systems. Mechanical systems in existing buildings shall be in accordance with Section 3405.1.4.1 through 3405.1.4.2

3405.1.4.1 General. Existing mechanical systems undergoing repair shall not make the building less conforming than it was before the repair was undertaken.

3405.1.4.2 Mechanical draft systems for manually fired appliances and fireplaces. A mechanical draft system shall be permitted to be used with manually fired appliances and fireplaces where such a system complies with all of the following requirements:

1. The mechanical draft device shall be listed and installed in accordance with the manufacturer’s installation instructions.
2. A device shall be installed that produces visible and audible warning upon failure of the mechanical draft device or loss of electrical power at any time that the mechanical draft device is turned on. This device shall be equipped with a battery backup if it receives power from the building wiring.
3. A smoke detector shall be installed in the room with the appliance or fireplace. This device shall be equipped with a battery backup if it receives power from the building wiring.

3405.1.5 Plumbing. Plumbing fixtures, supplies and materials in existing buildings shall be in accordance with Sections 3405.1.5.1 through 3405.1.5.2.

3405.1.5.1 Plumbing materials. Plumbing materials and supplies shall not be used for repairs that are prohibited in the International Plumbing Code.

3405.1.5.2 Water closet replacement. The maximum water consumption flow rates and quantities for all replaced water closets shall be 1.6 gallons (6 L) per flushing cycle.

Exception: Blowout-design water closets [3.5 gallons (13 L) per flushing cycle].

SECTION 3406
LEVEL 1 ALTERATIONS.

3406.1 General. Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose shall comply with the requirements of this section. Level 1 alterations to historic buildings shall comply with this chapter, except as modified in Section 3411.

3406.2 Safety. An existing building or portion thereof shall not be altered such that the building becomes less safe than its existing condition. Where the current level of safety or sanitation is proposed to be reduced, the portion altered shall conform to the requirements of the International Building Code.

(INTERIOR FINISHES AND BUILDING MATERIALS ARE COVERED IN SECTION 3401.4)

[FG] 3406.3 International Fuel Gas Code. The following sections of the *International Fuel Gas Code* shall constitute the fuel gas materials and methods requirements for Level 1 alterations.

1. All of Chapter 3, entitled "General Regulations," except Sections 303.7 and 306.
2. All of Chapter 4, entitled "Gas Piping Installations," except Sections 401.8 and 402.3.
    - 2.1. Sections 401.8 and 402.3 shall apply when the work being performed increases the load on the system such that the existing pipe does not meet the size required by code. Existing systems that are modified shall not require resizing as long as the load on the system is not increased and the system length is not increased even if the altered system does not meet code minimums.
3. All of Chapter 5, entitled "Chimneys and Vents."
4. All of Chapter 6, entitled "Specific Appliances."

(*FIRE PROTECTION AND MEANS OF EGRESS ARE MEANINGLESS)*

3406.4 Accessibility. A facility that is altered shall comply with the applicable provisions in Sections 3401.7

3406.5 Structural. Where alteration work includes replacement of equipment that is supported by the building or where a reroofing permit is required, the provisions of this section shall apply.

3406.5.1 Addition or replacement of roofing or replacement of equipment. Where addition or replacement of roofing or replacement of equipment results in additional dead loads, structural components supporting such reroofing or equipment shall comply with the gravity load requirements of this code.

Exceptions:

1. Structural elements where the additional dead load from the roofing or equipment does not increase the force in the element by more than 5 percent.
2. Buildings constructed in accordance with the *International Residential Code* or the conventional lightframe construction methods of the *International Building Code* and where the dead load from the roofing or equipment is not increased by more than 5 percent.
3. Addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m2) or less over an existing, single layer of roof covering.

3406.5.2 Additional requirements for reroof permits. The requirements of this section shall apply to *alteration* work requiring reroof permits.

3406.5.2.1 Bracing for unreinforced masonry bearing wall parapets. Where a permit is issued for reroofing for more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing to resist the reduced *International Building Code* level seismic forces as specified in Section 3401.6.4.4 of this code, unless an evaluation demonstrates compliance of such items.

3406.5.2.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the basic wind speed is greater than 90 mph or in a special wind region, as defined in Section 1609 of the *International Building Code*, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code*.

3406.6 Energy code compliance. Level 1 alterations to existing buildings or structures shall only require the portions of the building altered to comply with energy requirements of the International Energy Conservation Code or International Residential Code.

(ALTERATIONS—LEVEL 2
SECTION 801)

SECTION 3407
LEVEL 2 ALTERATIONS.

3407.1 Level 2 alterations. Level 2 alterations shall be in accordance with Sections 3407.1.1 through 3407.11.1.

3407.1.1 Scoping. Level 2 alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of additional equipment shall comply with the requirements of this section.

3407.1.2 Accessibility. Buildings in which the reconfiguration is exclusively the result of compliance with the accessibility requirements of Section 3401.7 shall be permitted to comply with level 1 alterations per Section 3406.

3407.1.3 Limits to compliance. All new construction elements, components, systems, and spaces shall comply with the requirements of this code for new construction.

Exceptions:

1. Windows may be added without requiring compliance with the light and ventilation requirements.
2. Newly installed electrical equipment shall comply with the requirements of Section 3404.11.
3. The length of dead-end corridors in newly constructed spaces shall only be required to comply with the provisions of Section 3407.6.6.
4. The minimum ceiling height of the newly created habitable and occupiable spaces and corridors shall be 7 feet (2134 mm).

(SECTION 802 SPECIAL USE AND OCCUPANCY)

3407.2 Special use and occupancy. Alteration of buildings classified as special use and occupancy as described in the International Building Code shall comply with the requirements of Section 3407.1.1 and the scoping provisions of Chapter 1 where applicable.

(SECTION 803 BUILDING ELEMENTS AND MATERIALS)

3407.3 Building elements and materials. The requirements of this section are limited to work areas in which Level 2 alterations are being performed, and shall apply beyond the work area where specified.

3407.3.1 Vertical openings. Existing vertical openings shall comply with the provisions of Sections 3407.3.1.1, 3407.3.1.2 and 3407.3.1.3.

3407.3.1.1 Existing vertical openings. All existing interior vertical openings connecting two or more floors shall be enclosed with approved assemblies having a fire-resistance rating of not less than 1 hour with approved opening protectives.

Exceptions:

1. Where vertical opening enclosure is not required by the International Building Code or the International Fire Code.
2. Interior vertical openings other than stairways may be blocked at the floor and ceiling of the work area by installation of not less than 2 inches (51 mm) of solid wood or equivalent construction.
3. The enclosure shall not be required where:
   3.1. Connecting the main floor and mezzanines; or
   3.2. All of the following conditions are met:
      3.2.1. The communicating area has a low hazard occupancy or has a moderate hazard occupancy that is protected throughout by an automatic sprinkler system.
      3.2.2. The lowest or next to the lowest level is a street floor.
      3.2.3. The entire area is open and unobstructed in a manner such that it may be assumed that a fire in any part of the interconnected spaces will be readily obvious to all of the occupants.
      3.2.4. Exit capacity is sufficient to provide egress simultaneously for all occupants of all levels by considering all areas to be a single floor area for the determination of required exit capacity.
      3.2.5. Each floor level, considered separately, has at least one-half of its individual required exit capacity provided by an exit or exits leading directly out of that level without having to traverse another communicating floor level or be exposed to the smoke or fire spreading from another communicating floor level.
4. In Group A occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories.
5. In Group B occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 3407.3.1.1, shall not be required in the following locations:
   5.1. Buildings not exceeding 3,000 square feet (279 m2) per floor.
   5.2. Buildings protected throughout by an approved automatic fire sprinkler system.
6. In Group E occupancies, the enclosure shall not be required for vertical openings not exceeding three stories when the building is protected throughout by an approved automatic fire sprinkler system.
7. In Group F occupancies, the enclosure shall not be required in the following locations:
   7.1. Vertical openings not exceeding three stories.
   7.2. Special purpose occupancies where necessary for manufacturing operations and direct access is provided to at least one protected stairway.
   7.3. Buildings protected throughout by an approved automatic sprinkler system.
8. In Group H occupancies, the enclosure shall not be required for vertical openings not exceeding three stories where necessary for manufacturing operations and every floor level has direct access to at least two remote enclosed stairways or other approved exits.
9. In Group M occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 3407.3.1.1, shall not be required in the following locations:
   9.1. Openings connecting only two floor levels.
   9.2. Occupancies protected throughout by an approved automatic sprinkler system.
10. In Group R-1 occupancies, the enclosure shall not be required for vertical openings not exceeding three stories in the following locations:
   10.1. Buildings protected throughout by an approved automatic sprinkler system.
   10.2. Buildings with less than 25 dwelling units or sleeping units where every sleeping room above the second floor is provided with direct access to a fire escape or other approved

second exit by means of an approved exterior door or window having a sill height of not greater than 44 inches (1118 mm) and where:

10.2.1. Any exit access corridor exceeding 8 feet (2438 mm) in length that serves two means of egress, one of which is an unprotected vertical opening, shall have at least one of the means of egress separated from the vertical opening by a 1-hour fire barrier; and

10.2.2. The building is protected throughout by an automatic fire alarm system, installed and supervised in accordance with the International Building Code.

11. In Group R-2 occupancies, a minimum 30-minute enclosure shall be provided to protect all vertical openings not exceeding three stories. This enclosure, or the enclosure specified in Section 3407.3.1.1, shall not be required in the following locations:
    11.1. Vertical openings not exceeding two stories with not more than four dwelling units per floor.
    11.2. Buildings protected throughout by an approved automatic sprinkler system.
    11.3. Buildings with not more than four dwelling units per floor where every sleeping room above the second floor is provided with direct access to a fire escape or other approved second exit by means of an approved exterior door or window having a sill height of not greater than 44 inches (1118 mm) and the building is protected throughout by an automatic fire alarm system complying with Section 3407.4.3.
12. One- and two-family dwellings.
13. Group S occupancies where connecting not more than two floor levels or where connecting not more than three floor levels and the structure is equipped throughout with an approved automatic sprinkler system.
14. Group S occupancies where vertical opening protection is not required for open parking garages and ramps.

3407.3.1.2 Supplemental shaft and floor opening enclosure requirements. Where the work area on any floor exceeds 50 percent of that floor area, the enclosure requirements of Section 3407.3.1 shall apply to vertical openings other than stairways throughout the floor.

Exception: Vertical openings located in tenant spaces that are entirely outside the work area.

3407.3.1.3 Supplemental stairway enclosure requirements. Where the work area on any floor exceeds 50 percent of that floor area, stairways that are part of the means of egress serving the work area shall, at a minimum, be enclosed with smoke-tight construction on the highest work area floor and all floors below.

Exception: Where stairway enclosure is not required by the International Building Code or the International Fire Code.

3407.3.2 Smoke barriers. Smoke barriers in Group I-2 occupancies shall be installed where required by Sections 3407.3.2.1 and 3407.3.2.2.

3407.3.2.1 Compartmentation. Where the work area is on a story used for sleeping rooms for more than 30 patients, the story shall be divided into not less than two compartments by smoke barrier walls complying with Section 3407.3.2.2 such that each compartment does not exceed 22,500 square feet (2093 m2), and the travel distance from any point to reach a door in the required smoke barrier shall not exceed 200 feet (60 960 mm).

Exception: Where neither the length nor the width of the smoke compartment exceeds 150 feet (45 720 mm), the travel distance to reach the smoke barrier door shall not be limited.

3407.3.2.2 Fire-resistance rating. The smoke barriers shall be fire-resistance rated for 30 minutes and constructed in accordance with the International Building Code.

3407.3.3 Interior finish. The interior finish of walls and ceilings in exits and corridors in any work area shall comply with the requirements of the International Building Code.

> **Exception:** Existing interior finish materials that do not comply with the interior finish requirements of the International Building Code shall be permitted to be treated with an approved fire-retardant coating in accordance with the manufacturer's instructions to achieve the required rating.

3407.3.3.1 Supplemental interior finish requirements. Where the work area on any floor exceeds 50 percent of the floor area, Section 3407.3.3 shall also apply to the interior finish in exits and corridors serving the work area throughout the floor.

> **Exception:** Interior finish within tenant spaces that are entirely outside the work area.

3407.3.4 Guards. The requirements of Sections 3407.3.4.1 and 3407.3.4.2 shall apply in all work areas.

3407.3.4.1 Minimum requirement. Every portion of a floor, such as a balcony or a loading dock, that is more than 30 inches (762 mm) above the floor or grade below and is not provided with guards, or those in which the existing guards are judged to be in danger of collapsing, shall be provided with guards.

3407.3.4.2 Design. Where there are no guards or where existing guards must be replaced, the guards shall be designed and installed in accordance with the International Building Code.

(SECTION 804 FIRE PROTECTION)

3407.4 Fire protection. The requirements of this section shall be limited to work areas in which Level 2 alterations are being performed, and where specified they shall apply throughout the floor on which the work areas are located or otherwise beyond the work area.

3407.4.1 Corridor ratings. Where an approved automatic sprinkler system is installed throughout the story, the required fire-resistance rating for any corridor located on the story shall be permitted to be reduced in accordance with the International Building Code. In order to be considered for a corridor rating reduction, such system shall provide coverage for the stairwell landings serving the floor and the intermediate landings immediately below.

3407.4.2 Automatic sprinkler systems. Automatic sprinkler systems shall be provided in accordance with the requirements of Sections 3407.4.2.1 through 3407.4.2.5. Installation requirements shall be in accordance with the International Building Code.

3407.4.2.1 High-rise buildings. In high-rise buildings, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection in the entire work area where the work area is located on a floor that has a sufficient sprinkler water supply system from an existing standpipe or a sprinkler riser serving that floor.

3407.4.2.1.1 Supplemental automatic sprinkler system requirements. Where the work area on any floor exceeds 50 percent of that floor area, Section 3407.4.2.1 shall apply to the entire floor on which the work area is located.

> **Exception:** Tenant spaces that are entirely outside the work area.

3407.4.2.2 Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1 and S-2. In buildings with occupancies in Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1 and S-2, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection where all of the following conditions occur:

1. The work area is required to be provided with automatic sprinkler protection in accordance with the International Building Code as applicable to new construction; and
2. The work area exceeds 50 percent of the floor area.

Exceptions:

1. Work areas in Group R occupancies three stories or less in height.
2. If the building does not have sufficient municipal water supply for design of a fire sprinkler system available to the floor without installation of a new fire pump, work areas shall be protected by an automatic smoke detection system throughout all occupiable spaces other than sleeping units or individual dwelling units that activates the occupant notification system in accordance with Sections 907.4, 907.5 and 907.6 of the International Building Code.

3407.4.2.2.1 Mixed uses. In work areas containing mixed uses, one or more of which requires automatic sprinkler protection in accordance with Section 3407.4.2.2, such protection shall not be required throughout the work area provided that the uses requiring such protection are separated from those not requiring protection by fire-resistance-rated construction having a minimum 2-hour rating for Group H and a minimum 1-hour rating for all other occupancy groups.

3407.4.2.3 Windowless stories. Work located in a windowless story, as determined in accordance with the International Building Code, shall be sprinklered where the work area is required to be sprinklered under the provisions of the International Building Code for newly constructed buildings and the building has a sufficient municipal water supply without installation of a new fire pump.

3407.4.2.4 Other required automatic sprinkler systems. In buildings and areas listed in Table 903.2.11.6, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with an automatic sprinkler system under the following conditions:

1. The work area is required to be provided with an automatic sprinkler system in accordance with the International Building Code applicable to new construction; and
2. The building has sufficient municipal water supply for design of an automatic sprinkler system available to the floor without installation of a new fire pump.

3407.4.2.5 Supervision. Fire sprinkler systems required by this section shall be supervised by one of the following methods:

1. Approved central station system in accordance with NFPA 72;
2. Approved proprietary system in accordance with NFPA 72;
3. Approved remote station system of the jurisdiction in accordance with NFPA 72; or
4. When approved by the code official, approved local alarm service that will cause the sounding of an alarm in accordance with NFPA 72.

Exception: Supervision is not required for the following:

1. Underground gate valve with roadway boxes.
2. Halogenated extinguishing systems.
3. Carbon dioxide extinguishing systems.
4. Dry- and wet-chemical extinguishing systems.
5. Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic and automatic sprinkler systems and a separate shutoff valve for the automatic sprinkler system is not provided.

3407.4.3 Standpipes. Where the work area includes exits or corridors shared by more than one tenant and is located more than 50 feet (15 240 mm) above or below the lowest level of fire department access, a standpipe system shall be provided. Standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access. Standpipe systems shall be installed in accordance with the International Building Code.

Exceptions:

1. No pump shall be required provided that the standpipes are capable of accepting delivery by fire department apparatus of a minimum of 250 gallons per minute (gpm) at 65 pounds per square inch (psi) (946 L/m at 448KPa) to the topmost floor in buildings equipped throughout with an automatic sprinkler system or a minimum of 500 gpm at 65 psi (1892 L/m at 448KPa) to the topmost floor in all other buildings. Where the standpipe terminates below the topmost floor, the standpipe shall be designed to meet (gpm/psi) (L/m/KPa) requirements of this exception for possible future extension of the standpipe.
2. The interconnection of multiple standpipe risers shall not be required.

3407.4.4 Fire alarm and detection. An approved fire alarm system shall be installed in accordance with Sections 3407.4.4.1 through 3407.4.4.3. Where automatic sprinkler protection is provided in accordance with Section 3407.4.2 and is connected to the building fire alarm system, automatic heat detection shall not be required.

An approved automatic fire detection system shall be installed in accordance with the provisions of this code and NFPA 72. Devices, combinations of devices, appliances, and equipment shall be approved. The automatic fire detectors shall be smoke detectors, except that an approved alternative type of detector shall be installed in spaces such as boiler rooms, where products of combustion are present during normal operation in sufficient quantity to actuate a smoke detector.

3407.4.4.1 Occupancy requirements. A fire alarm system shall be installed in accordance with Sections 3407.4.4.1.1 through 3407.4.4.1.7. Existing alarm-notification appliances shall be automatically activated throughout the building. Where the building is not equipped with a fire alarm system, alarm-notification appliances within the work area shall be provided and automatically activated.

Exceptions:

1. Occupancies with an existing, previously approved fire alarm system.
2. Where selective notification is permitted, alarm-notification appliances shall be automatically activated in the areas selected.

3407.4.4.1.1 Group E. A fire alarm system shall be installed in work areas of Group E occupancies as required by the International Fire Code for existing Group E occupancies.

3407.4.4.1.2 Group I-1. A fire alarm system shall be installed in work areas of Group I-1 residential care/assisted living facilities as required by the International Fire Code for existing Group I-1 occupancies.

3407.4.4.1.3 Group I-2. A fire alarm system shall be installed in work areas of Group I-2 occupancies as required by the International Fire Code for existing Group I-2 occupancies.

3407.4.4.1.4 Group I-3. A fire alarm system shall be installed in work areas of Group I-3 occupancies as required by the International Fire Code for existing Group I-3 occupancies.

3407.4.4.1.5 Group R-1. A fire alarm system shall be installed in Group R-1 occupancies as required by the International Fire Code for existing Group R-1 occupancies.

3407.4.4.1.6 Group R-2. A fire alarm system shall be installed in work areas of Group R-2 apartment buildings as required by the International Fire Code for existing Group R-2 occupancies.

3407.4.4.1.7 Group R-4. A fire alarm system shall be installed in work areas of Group R-4 residential care/assisted living facilities as required by the International Fire Code for existing Group R-4 occupancies.

3407.4.4.2 Supplemental fire alarm system requirements. Where the work area on any floor exceeds 50 percent of that floor area, Section 3407.4.4 .1 shall apply throughout the floor.

> **Exception:** Alarm-initiating and notification appliances shall not be required to be installed in tenant spaces outside of the work area.

3407.4.4.3 Smoke alarms. Individual sleeping units and individual dwelling units in any work area in Group R and I-1 occupancies shall be provided with smoke alarms in accordance with the International Fire Code.

> **Exception:** Interconnection of smoke alarms outside of the work area shall not be required.

(SECTION 805 MEANS OF EGRESS)

3407.5 Means of egress. Means of egress requirements for work areas in a level 2 alteration shall be in accordance with Sections 3407.5.1 through 3407.5.10.2 .

3407.5.1 Scope. The requirements of this section shall be limited to work areas that include exits or corridors shared by more than one tenant within the work area in which Level 2 alterations are being performed, and where specified they shall apply throughout the floor on which the work areas are located or otherwise beyond the work area.

3407.5.2 General. The means of egress shall comply with the requirements of this section.

Exceptions:

1. Where the work area and the means of egress serving it complies with NFPA 101.
2. Means of egress conforming to the requirements of the building code under which the building was constructed shall be considered compliant means of egress if, in the opinion of the code official, they do not constitute a distinct hazard to life.

3407.5.3 Number of exits. The number of exits shall be in accordance with Sections 3407.5.3.1 through 3407.5.3.3

3407.5.3.1 Minimum number. Every story utilized for human occupancy on which there is a work area that includes exits or corridors shared by more than one tenant within the work area shall be provided with the minimum number of exits based on the occupancy and the occupant load in accordance with the International Building Code. In addition, the exits shall comply with Sections 3407.5.3.1.1 and 3407.5.3.1.2.

3407.5.3.1.1 Single-exit buildings. Only one exit is required from buildings and spaces of the following occupancies:

1. In Group A, B, E, F, M, U and S occupancies, a single exit is permitted in the story at the level of exit discharge when the occupant load of the story does not exceed 50 and the exit access travel distance does not exceed 75 feet (22 860 mm).
2. Group B, F-2, and S-2 occupancies not more than two stories in height that are not greater than 3,500 square feet per floor (326 m2), when the exit access travel distance does not exceed 75 feet (22 860 mm). The minimum fire-resistance rating of the exit enclosure and of the opening protection shall be 1 hour.
3. Open parking structures where vehicles are mechanically parked.

4. In community residences for the developmentally disabled, the maximum occupant load excluding staff is 12.
5. Groups R-1 and R-2 not more than two stories in height, when there are not more than four dwelling units per floor and the exit access travel distance does not exceed 50 feet (15 240 mm). The minimum fire-resistance rating of the exit enclosure and of the opening protection shall be 1 hour.

6. In multilevel dwelling units in buildings of occupancy Group R-1 or R-2, an exit shall not be required from every level of the dwelling unit provided that one of the following conditions is met:
   6.1. The travel distance within the dwelling unit does not exceed 75 feet (22 860 mm); or
   6.2. The building is not more than three stories in height and all third-floor space is part of one or more dwelling units located in part on the second floor; and no habitable room within any such dwelling unit shall have a travel distance that exceeds 50 feet (15 240 mm) from the outside of the habitable room entrance door to the inside of the entrance door to the dwelling unit.
7. In Group R-2, H-4, H-5 and I occupancies and in rooming houses and child care centers, a single exit is permitted in a one-story building with a maximum occupant load of 10 and the exit access travel distance does not exceed 75 feet (22 860 mm).
8. In buildings of Group R-2 occupancy that are equipped throughout with an automatic fire sprinkler system, a single exit shall be permitted from a basement or story below grade if every dwelling unit on that floor is equipped with an approved window providing a clear opening of at least 5 square feet (0.47 m2) in area, a minimum net clear opening of 24 inches (610 mm) in height and 20 inches (508 mm) in width, and a sill height of not more than 44 inches (1118 mm) above the finished floor.
9. In buildings of Group R-2 occupancy of any height with not more than four dwelling units per floor; with a smokeproof enclosure or outside stair as an exit; and with such exit located within 20 feet (6096 mm) of travel to the entrance doors to all dwelling units served thereby.
10. In buildings of Group R-3 occupancy equipped throughout with an automatic fire sprinkler system, only one exit shall be required from basements or stories below grade.

3407.5.3.1.2 Fire escapes required. When more than one exit is required, an existing or newly constructed fire escape complying with Section 3407.5.3.1.2.1 shall be accepted as providing one of the required means of egress.

3407.5.3.1.2.1 Fire escape access and details. Fire escapes shall comply with all of the following requirements:

1. Occupants shall have unobstructed access to the fire escape without having to pass through a room subject to locking.
2. Access to a new fire escape shall be through a door, except that windows shall be permitted to provide access from single dwelling units or sleeping units in Group R-1, R-2 and I-1 occupancies or to provide access from spaces having a maximum occupant load of 10 in other occupancy classifications.
   2.1. The window shall have a minimum net clear opening of 5.7 square feet (0.53 m2) or 5 square feet (0.46 m2) where located at grade.
   2.2. The minimum net clear opening height shall be 24 inches (610 mm) and net clear opening width shall be 20 inches (508 mm).
   2.3. The bottom of the clear opening shall not be greater than 44 inches (1118 mm) above the floor.
   2.4. The operation of the window shall comply with the operational constraints of the International Building Code.
3. Newly constructed fire escapes shall be permitted only where exterior stairs cannot be utilized because of lot lines limiting the stair size or because of the sidewalks, alleys, or roads at grade level.
4. Openings within 10 feet (3048 mm) of fire escape stairs shall be protected by fire assemblies having minimum 3/4-hour fire-resistance ratings.

Exception: Opening protection shall not be required in buildings equipped throughout with an approved automatic sprinkler system.

5. In all buildings of Group E occupancy, up to and including the 12th grade, buildings of Group I occupancy, rooming houses and childcare centers, ladders of any type are prohibited on fire escapes used as a required means of egress.

3407.5.3.1.2.2 Construction. The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of steel or other approved noncombustible materials. Fire escapes constructed of wood not less than nominal 2 inches (51 mm) thick are permitted on buildings of Type V construction. Walkways and railings located over or supported by combustible roofs in buildings of Types III and IV construction are permitted to be of wood not less than nominal 2 inches (51 mm) thick.

3407.5.3.1.2.3 Dimensions. Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm). Landings at the foot of stairs shall not be less than 40 inches (1016 mm) wide by 36 inches (914 mm) long and located not more than 8 inches (203 mm) below the door.

3407.5.3.2 Mezzanines. Mezzanines in the work area and with an occupant load of more than 50 or in which the travel distance to an exit exceeds 75 feet (22 860 mm) shall have access to at least two independent means of egress.

Exception: Two independent means of egress are not required where the travel distance to an exit does not exceed 100 feet (30 480 mm) and the building is protected throughout with an automatic sprinkler system.

3407.5.3.3 Main entrance—Group A. All buildings of Group A with an occupant load of 300 or more shall be provided with a main entrance capable of serving as the main exit with an egress capacity of at least one-half of the total occupant load. The remaining exits shall be capable of providing one-half of the total required exit capacity.

Exception: Where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

3407.5.4 Egress doorways. Egress doorways in any work area shall comply with Sections 3407.5.4.1 through 3407.5.4.5.

3407.5.4.1 Two egress doorways required. Work areas shall be provided with two egress doorways in accordance with the requirements of Sections 3404.8.4.1.1 and 3404.8.4.1.2.

3407.5.4.1.1 Occupant load and travel distance. In any work area, all rooms and spaces having an occupant load greater than 50 or in which the travel distance to an exit exceeds 75 feet (22 860 mm) shall have a minimum of two egress doorways.

Exceptions:

1. Storage rooms having a maximum occupant load of 10.
2. Where the work area is served by a single exit in accordance with Section 3407.5.3.1.1.

3407.5.4.1.2 Group I-2. In buildings of Group I-2 occupancy, any patient sleeping room or suite of patient rooms greater than 1,000 square feet (93 m2) within the work area shall have a minimum of two egress doorways.

3407.5.4.2 Door swing. In the work area and in the egress path from any work area to the exit discharge, all egress doors serving an occupant load greater than 50 shall swing in the direction of exit travel.

3407.5.4.2.1 Supplemental requirements for door swing. Where the work area exceeds 50 percent of the floor area, door swing shall comply with Section 3407.5.4.2 throughout the floor.

Exception: Means of egress within or serving only a tenant space that is entirely outside the work area.

3407.5.4.3 Door closing. In any work area, all doors opening onto an exit passageway at grade or an exit stair shall be self-closing or automatic-closing by listed closing devices.

Exceptions:

1. Where exit enclosure is not required by the International Building Code.
2. Means of egress within or serving only a tenant space that is entirely outside the work area.

3407.5.4.3.1 Supplemental requirements for door closing. Where the work area exceeds 50 percent of the floor area, doors shall comply with Section 3407.5.4.3 throughout the exit stair from the work area to, and including, the level of exit discharge.

3407.5.4.4 Panic hardware. In any work area, and in the egress path from any work area to the exit discharge, in buildings or portions thereof of Group A assembly occupancies with an occupant load greater than 100, all required exit doors equipped with latching devices shall be equipped with approved panic hardware.

3407.5.4.4.1 Supplemental requirements for panic hardware. Where the work area exceeds 50 percent of the floor area, panic hardware shall comply with Section 3407.5.4.4 throughout the floor.

Exception: Means of egress within a tenant space that is entirely outside the work area.

3407.5.4.5 Emergency power source in Group I-3. Work areas in buildings of Group I-3 occupancy having remote power unlocking capability for more than 10 locks shall be provided with an emergency power source for such locks. Power shall be arranged to operate automatically upon failure of normal power within 10 seconds and for a duration of not less than 1 hour.

3407.5.5 Openings in corridor walls. Openings in corridor walls in any work area shall comply with Sections 3407.5.5.1 through 3407.5.5.4.

Exception: Openings in corridors where such corridors are not required to be rated in accordance with the International Building Code.

3407.5.5.1 Corridor doors. Corridor doors in the work area shall not be constructed of hollow core wood and shall not contain louvers. All dwelling unit or sleeping unit corridor doors in work areas in buildings of Groups R-1, R-2, and I-1 shall be at least 13/8-inch (35 mm) solid core wood or approved equivalent and shall not have any glass panels, other than approved wired glass or other approved glazing material in metal frames. All dwelling unit or sleeping unit corridor doors in work areas in buildings of Groups R-1, R-2, and I-1 shall be equipped with approved door closers. All replacement doors shall be 13/4-inch (45 mm) solid bonded wood core or approved equivalent, unless the existing frame will accommodate only a 13/8-inch (35 mm) door.

Exceptions:

1. Corridor doors within a dwelling unit or sleeping unit.

2. Existing doors meeting the requirements of Guidelines on Fire Ratings of Archaic Materials and Assemblies (IEBC Resource A) for a rating of 15 minutes or more shall be accepted as meeting the provisions of this requirement.
3. Existing doors in buildings protected throughout with an approved automatic sprinkler system shall be required only to resist smoke, be reasonably tight fitting, and shall not contain louvers.
4. In group homes with a maximum of 15 occupants and that are protected with an approved automatic detection system, closing devices may be omitted.
5. Door assemblies having a fire protection rating of at least 20 minutes.

3407.5.5.2 Transoms. In all buildings of Group I-1, R-1 and R-2 occupancy, all transoms in corridor walls in work areas shall either be glazed with 1/4-inch (6.4 mm) wired glass set in metal frames or other glazing assemblies having a fire protection rating as required for the door and permanently secured in the closed position or sealed with materials consistent with the corridor construction.

3407.5.5.3 Other corridor openings. In any work area, any other sash, grille, or opening in a corridor and any window in a corridor not opening to the outside air shall be sealed with materials consistent with the corridor construction.

3407.5.5.3.1 Supplemental requirements for other corridor opening. Where the work area exceeds 50 percent of the floor area, Section 3407.5.5.3 shall be applicable to all corridor windows, grills, sashes, and other openings on the floor.

Exception: Means of egress within or serving only a tenant space that is entirely outside the work area.

3407.5.5.4 Supplemental requirements for corridor openings. Where the work area on any floor exceeds 50 percent of the floor area, the requirements of Sections 3407.5.5.1 through 3407.5.5.3 shall apply throughout the floor.

3407.5.6 Dead-end corridors. Dead-end corridors in any work area shall not exceed 35 feet (10 670 mm).

Exceptions:

1. Where dead-end corridors of greater length are permitted by the International Building Code.
2. In other than Group A and H occupancies, the maximum length of an existing dead-end corridor shall be 50 feet (15 240 mm) in buildings equipped throughout with an automatic fire alarm system installed in accordance with the International Building Code.
3. In other than Group A and H occupancies, the maximum length of an existing dead-end corridor shall be 70 feet (21 356 mm) in buildings equipped throughout with an automatic sprinkler system installed in accordance with the International Building Code.
4. In other than Group A and H occupancies, the maximum length of an existing, newly constructed, or extended dead-end corridor shall not exceed 50 feet (15 240 mm) on floors equipped with an automatic sprinkler system installed in accordance with the International Building Code.

3407.5.7 Means-of-egress lighting. Means-of-egress lighting shall be in accordance with Section 3407.5.7.1 through 3407.5.7.2, as applicable.

3407.5.7.1 Artificial lighting required. Means of egress in all work areas shall be provided with artificial lighting in accordance with the requirements of the International Building Code.

3407.5.7.2 Supplemental requirements for means-of-egress lighting. Where the work area on any floor exceeds 50 percent of that floor area, means of egress throughout the floor shall comply with Section 3407.5.7.1.

Exception: Means of egress within or serving only a tenant space that is entirely outside the work area.

3407.5.8 Exit signs. Exit signs shall be in accordance with Sections 3407.5.8.1 and 3407.5.8.2, as applicable.

3407.5.8.1 Work areas. Means of egress in all work areas shall be provided with exit signs in accordance with the requirements of the International Building Code.

3407.5.8.2 Supplemental requirements for exit signs. Where the work area on any floor exceeds 50 percent of that floor area, means of egress throughout the floor shall comply with Section 3407.5.8.1.

Exception: Means of egress within a tenant space that is entirely outside the work area.

3407.5.9 Handrails. The requirements of Sections 3407.5.9.1 and 3407.5.9.2 shall apply to handrails from the work area floor to, and including, the level of exit discharge.

3407.5.9.1 Minimum requirement. Every required exit stairway that is part of the means of egress for any work area and that has three or more risers and is not provided with at least one handrail, or in which the existing handrails are judged to be in danger of collapsing, shall be provided with handrails for the full length of the run of steps on at least one side. All exit stairways with a required egress width of more than 66 inches (1676 mm) shall have handrails on both sides.

3407.5.9.2 Design. Handrails required in accordance with Section 3407.5.9.1 shall be designed and installed in accordance with the provisions of the International Building Code.

3407.5.10 Guards. The requirements of Sections 3407.5.10.1 and 3407.5.10.2 shall apply to guards from the work area floor to, and including, the level of exit discharge but shall be confined to the egress path of any work area.

3407.5.10.1 Minimum requirement. Every open portion of a stair, landing, or balcony that is more than 30 inches (762 mm) above the floor or grade below and is not provided with guards, or those portions in which existing guards are judged to be in danger of collapsing, shall be provided with guards.

3407.5.10.2 Design. Guards required in accordance with Section 3407.5.10.1 shall be designed and installed in accordance with the International Building Code.

(SECTION 806 ACCESSIBILITY)

3407.6 Accessibility. A building, facility, or element that is altered shall comply with Sections 3407.6.1 through 3407.6.4 and Section 3406.4.

3407.6.1 Stairs and escalators in existing buildings. In alterations where an escalator or stair is added where none existed previously, an accessible route shall be provided in accordance with Sections 1104.4 and 1104.5.

3407.6.2 Accessible dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for accessible units and Chapter 9 for visible alarms apply only to the quantity of spaces being added.

3407.6.3 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type A units and Chapter 9 for visible alarms apply only to the quantity of the spaces being added.

3407.6.4 Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type B units and Chapter 9 for visible alarms apply only to the quantity of the spaces being added.

(SECTION 807STRUCTURAL)

3407.7 Structural. Structural elements and systems within buildings undergoing Level 2 alterations shall comply with Sections 3407.7.1 through 3407.7.5

3407.7.1 New structural elements. New structural elements in alterations, including connections and anchorage, shall comply with the International Building Code.

3407.7.2 Minimum design loads. The minimum design loads on existing elements of a structure that do not support additional loads as a result of an alteration shall be the loads applicable at the time the building was constructed.

3407.7.3 Existing structural elements carrying gravity loads. Alterations shall not reduce the capacity of existing gravity load-carrying structural elements unless it is demonstrated that the elements have the capacity to carry the applicable design gravity loads required by the International Building Code. Existing structural elements supporting any additional gravity loads as a result of the alterations, including the effects of snow drift, shall comply with the International Building Code.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with not more than five dwelling or sleeping units used solely for residential purposes where the existing building and its alteration comply with the conventional light-frame construction methods of the International Building Code or the provisions of the International Residential Code.

3407.7.4 Existing structural elements resisting lateral loads. Alterations affecting the demands or capacities of existing elements of the lateral load-resisting system shall be evaluated using the wind provisions of the International Building Code and the reduced IBC-level seismic forces. Any existing lateral load-resisting structural elements whose demand-capacity ratio with the alteration considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be brought into compliance with those wind and seismic provisions. In addition, the alteration shall not create a structural irregularity prohibited by ASCE 7 unless the entire structure complies with Section 3401.6.4.4. For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of additions and alterations since the original construction.

3407.7.5 Voluntary lateral force-resisting system alterations. Alterations of existing structural elements and additions of new structural elements that are initiated for the purpose of increasing the lateral force-resisting strength or stiffness of an existing structure and that are not required by other sections of this code shall not be required to be designed for forces conforming to the International Building Code, provided that an engineering analysis is submitted to show that:

1. The capacity of existing structural elements required to resist forces is not reduced;
2. The lateral loading to existing structural elements is not increased either beyond its capacity or more than 10 percent;
3. New structural elements are detailed and connected to the existing structural elements as required by the International Building Code;
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the International Building Code; and

5. A dangerous condition as defined in this code is not created. Voluntary alterations to lateral force-resisting systems conducted in accordance with Appendix A and the referenced standards of this code shall be permitted.

(SECTION 808 ELECTRICAL)

3407.8 Electrical. Electrical equipment and wiring in buildings undergoing a level 2 alteration shall be in accordance with Sections 3407.8.1 through 3407.8.3.

3407.8.1 New installations. All newly installed electrical equipment and wiring relating to work done in any work area shall comply with the materials and methods requirements of Section 3406.1.

> **Exception:** Electrical equipment and wiring in newly installed partitions and ceilings shall comply with all applicable requirements of NFPA 70.

3407.8.2 Existing installations. Existing wiring in all work areas in Group A-1, A-2, A-5, H and I occupancies shall be upgraded to meet the materials and methods requirements of Section 3404.3.

3407.8.3 Residential occupancies. In Group R-2, R-3 and R-4 occupancies and buildings regulated by the International Residential Code, the requirements of Sections 3407.8.3.1 through 3407.8.3.7 shall be applicable only to work areas located within a dwelling unit.

3407.8.3.1 Enclosed areas. All enclosed areas, other than closets, kitchens, basements, garages, hallways, laundry areas, utility areas, storage areas and bathrooms shall have a minimum of two duplex receptacle outlets or one duplex receptacle outlet and one ceiling or wall-type lighting outlet.

3407.8.3.2 Kitchens. Kitchen areas shall have a minimum of two duplex receptacle outlets.

3407.8.3.3 Laundry areas. Laundry areas shall have a minimum of one duplex receptacle outlet located near the laundry equipment and installed on an independent circuit.

3407.8.3.4 Ground fault circuit interruption. Newly installed receptacle outlets shall be provided with ground fault circuit interruption as required by NFPA 70.

3407.8.3.5 Minimum lighting outlets. At least one lighting outlet shall be provided in every bathroom, hallway, stairway, attached garage, and detached garage with electric power, and to illuminate outdoor entrances and exits.

3407.8.3.6 Utility rooms and basements. At least one lighting outlet shall be provided in utility rooms and basements where such spaces are used for storage or contain equipment requiring service.

3407.8.3.7 Clearance for equipment. Clearance for electrical service equipment shall be provided in accordance with the NFPA 70.

(SECTION 809 MECHANICAL)

3407.9 Mechanical. Mechanical ventilation in buildings undergoing a level 2 alteration shall be in accordance with Sections 3407.9.1 through 3407.9.3

3407.9.1 Mechanical. All reconfigured spaces intended for occupancy and all spaces converted to habitable or occupiable space in any work area shall be provided with natural or mechanical ventilation in accordance with the International Mechanical Code.

> **Exception:** Existing mechanical ventilation systems shall comply with the requirements of Section 3407.9.2.

3407.9.2 Altered existing systems. In mechanically ventilated spaces, existing mechanical ventilation systems that are altered, reconfigured, or extended shall provide not less than 5 cubic feet per minute (cfm) (0.0024 m3/s) per person of outdoor air and not less than 15 cfm (0.0071 m3/s) of ventilation air per person; or not less than the amount of ventilation air determined by the Indoor Air Quality Procedure of ASHRAE 62.

3407.9.3 Local exhaust. All newly introduced devices, equipment, or operations that produce airborne particulate matter, odors, fumes, vapor, combustion products, gaseous contaminants, pathogenic and allergenic organisms, and microbial contaminants in such quantities as to affect adversely or impair health or cause discomfort to occupants shall be provided with local exhaust.

(SECTION 810 PLUMBING)

3407.10 Plumbing fixtures. Where the occupant load of the story is increased by more than 20 percent, plumbing fixtures for the story shall be provided in quantities specified in the International Plumbing Code based on the increased occupant load.

(SECTION 811 ENERGY CONSERVATION)

3407.11 Energy conservation. Level 2 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the International Energy Conservation Code or International Residential Code. The alterations shall conform to the energy requirements of the International Energy Conservation Code or International Residential Code as they relate to new construction only.

(CHAPTER 9 ALTERATIONS—LEVEL 3, SECTION 901GENERAL)

SECTION 3408
LEVEL 3 ALTERATIONS

3408.1 General. Level 3 alterations shall comply with Sections 3408.1.1 through 3408.9

3408.1 Scoping. Level 3 alterations includes alterations where the work area exceeds 50% of the aggregate area of the building.

3408.2 Compliance. In addition to the provisions of this chapter, work shall comply with all of the requirements of Chapters 3406 and 3407. The requirements of Sections 3407.3, 3407.4 and 3407.5 shall apply within all work areas whether or not they include exits and corridors shared by more than one tenant and regardless of the occupant load.

> **Exception:** Buildings in which the reconfiguration of space affecting exits or shared egress access is exclusively the result of compliance with the accessibility requirements of Section 3406.4 shall not be required to comply with this chapter.

(SECTION 902 SPECIAL USE AND OCCUPANCY)

3408.3 Special use and occupancy. Buildings undergoing a level 3 alteration containing a special use shall be in accordance with this section.

3408.3.1 High-rise buildings. Any building having occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall comply with the requirements of Sections 3408.3.1.1 and 3408.3.1.2.

3408.3.1.1 Recirculating air or exhaust systems. When a floor is served by a recirculating air or exhaust system with a capacity greater than 15,000 cubic feet per minute (701 m3/s), that system shall be equipped with approved smoke and heat detection devices installed in accordance with the International Mechanical Code.

3408.3.1.2 Elevators. Where there is an elevator or elevators for public use, at least one elevator serving the work area shall comply with this section. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1.

3408.3.2 Boiler and furnace equipment rooms. Boiler and furnace equipment rooms adjacent to or within the following facilities shall be enclosed by 1-hour fire-resistance-rated construction: day nurseries, children's shelter facilities, residential childcare facilities, and similar facilities with children below the age of 21/2 years or that are classified as Group I-2 occupancies, shelter facilities, residences for the developmentally disabled, group homes, teaching family homes, transitional living homes, rooming and boarding houses, hotels, and multiple dwellings.

Exceptions:

1. Furnace and boiler equipment of low-pressure type, operating at pressures of 15 pounds per square inch gauge (psig) (103.4 KPa) or less for steam equipment or 170 psig (1171 KPa) or less for hot water equipment, when installed in accordance with manufacturer recommendations.
2. Furnace and boiler equipment of residential R-3 type with 200,000 British thermal units (Btu) (2.11 × 108 J) per hour input rating or less is not required to be enclosed.
3. Furnace rooms protected with automatic sprinkler protection.

3408.3.2.1 Emergency controls. Emergency controls for boilers and furnace equipment shall be provided in accordance with the International Mechanical Code in all buildings classified as day nurseries, children's shelter facilities, residential childcare facilities, and similar facilities with children below the age of 21/2 years or that are classified as Group I-2 occupancies, and in group homes, teaching family homes, and supervised transitional living homes in accordance with the following:

1. Emergency shutoff switches for furnaces and boilers in basements shall be located at the top of the stairs leading to the basement; and
2. Emergency shutoff switches for furnaces and boilers in other enclosed rooms shall be located outside of such room.

(SECTION 903 BUILDING ELEMENTS AND MATERIALS)

3408.4 Building elements and materials. Building elements and materials shall be in accordance with this section.

3408.4.1 Existing shafts and vertical openings. Existing stairways that are part of the means of egress shall be enclosed in accordance with Section 3407.3.1.1 from the highest work area floor to, and including, the level of exit discharge and all floors below.

3408.4.2 Fire partitions in Group R-3. Fire separation in Group R-3 occupancies shall be in accordance with Section 3408.4.2.1.

3408.4.2.1 Separation required. Where the work area is in any attached dwelling unit in Group R-3 or any multiple single-family dwelling (townhouse), walls separating the dwelling units that are not continuous from the foundation to the underside of the roof sheathing shall be constructed to provide a continuous fire separation using construction materials consistent with the existing wall or complying with the requirements for new structures. All work shall be performed on the side of the dwelling unit wall that is part of the work area.

Exception: Where alterations or repairs do not result in the removal of wall or ceiling finishes exposing the structure, walls are not required to be continuous through concealed floor spaces.

3408.4.3 Interior finish. Interior finish in exits serving the work area shall comply with Section 3407.3.3 between the highest floor on which there is a work area to the floor of exit discharge.

(SECTION 904 FIRE PROTECTION)

3408.5 Fire protection. Fire protection requirements for buildings undergoing level 3 alterations shall be in accordance with this section.

3408.5.1 Automatic sprinkler systems. Automatic sprinkler systems shall be provided in all work areas when required by Section 3407.4.2 or this section.

3408.5.1.1 High-rise buildings. In high-rise buildings, work areas shall be provided with automatic sprinkler protection where the building has a sufficient municipal water supply system to the site. Where the work area exceeds 50 percent of floor area, sprinklers shall be provided in the specified areas where sufficient municipal water supply for design and installation of a fire sprinkler system is available at the site.

3408.5.1.2 Rubbish and linen chutes. Rubbish and linen chutes located in the work area shall be provided with automatic sprinkler system protection or an approved automatic fire-extinguishing system where protection of the rubbish and linen chute would be required under the provisions of the International Building Code for new construction.

3408.5.2 Fire alarm and detection systems. Fire alarm and detection systems complying with Sections 3407.4.4.1 and 3407.4.4.3 shall be provided throughout the building in accordance with the International Building Code.

3408.5.2.1 Manual fire alarm systems. Where required by the International Building Code, a manual fire alarm system shall be provided throughout the work area. Alarm notification appliances shall be provided on such floors and shall be automatically activated as required by the International Building Code.

Exceptions:

1. Alarm-initiating and notification appliances shall not be required to be installed in tenant spaces outside of the work area.
2. Visual alarm notification appliances are not required, except where an existing alarm system is upgraded or replaced or where a new fire alarm system is installed.

3408.5.2.2 Automatic fire detection. Where required by the International Building Code for new buildings, automatic fire detection systems shall be provided throughout the work area.

(SECTION 905 MEANS OF EGRESS)

3408.6. Means of egress. The means of egress shall comply with the requirements of Section 3407.5 except as specifically required in Sections 3408.6.1 and 3408.6.2.

3408.6.1 Means-of-egress lighting. Means of egress from the highest work area floor to the floor of exit discharge shall be provided with artificial lighting within the exit enclosure in accordance with the requirements of the International Building Code.

3408.6.2 Exit signs. Means of egress from the highest work area floor to the floor of exit discharge shall be provided with exit signs in accordance with the requirements of the International Building Code.

(SECTION 906 ACCESSIBILITY)

3408.7 Accessibility. A building, facility or element that is altered shall comply with this section and Sections 3406.4 and 3407.6

3408.7.1 Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 of the International Building Code for Type B units and Chapter 9 for visible alarms apply only to the quantity of the spaces being altered or added.

(SECTION 907STRUCTURAL)

3408.8 Structural. Where buildings are undergoing Level 3 alterations including structural alterations, the provisions of this section shall apply.

3408.8.1 New structural elements. New structural elements shall comply with Section 3407.7.1.

3408.8.2 Existing structural elements carrying gravity loads. Existing structural elements carrying gravity loads shall comply with Section 3407.7.3.

3408.8.3 Existing structural elements resisting lateral loads. All existing elements of the lateral force-resisting system shall comply with this section.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes that are altered based on the conventional light-frame construction methods of the International Building Code or in compliance with the provisions of the International Residential Code.
2. Where such alterations involve only the lowest story of a building and the change of occupancy provisions of Section 3409 do not apply, only the lateral force-resisting components in and below that story need comply with this section.

3408.8.3.1 Evaluation and analysis. An engineering evaluation and analysis that establishes the structural adequacy of the altered structure shall be prepared by a registered design professional and submitted to the code official.

3408.8.3.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural alteration within a five-year period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the International Building Code for wind loading and with reduced IBC-level seismic forces. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

3408.8.3.3 Limited structural alteration. Where the work does not involve a substantial structural alteration, the existing elements of the lateral load-resisting system shall comply with Section 3407.7.4.

3408.8.3.4 Wall anchors for concrete and masonry buildings. For any building assigned to Seismic Design Category D, E or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm or unreinforced masonry walls with any type of roof diaphragm, the alteration work shall include installation of wall anchors at the roof line to resist the reduced IBC-level seismic forces, unless an evaluation demonstrates compliance of existing wall anchorage.

3408.8.3.5 Bracing for unreinforced masonry parapets. Parapets constructed of unreinforced masonry in buildings assigned to Seismic Design Category D, E or F shall have bracing installed as needed to resist the reduced IBC-level seismic forces, unless an evaluation demonstrates compliance of such items.

(SECTION 908 ENERGY CONSERVATION)

3408.9 Energy conservation. Level 3 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the International Energy Conservation Code or International Residential Code. The alterations shall conform to the energy requirements of the International Energy Conservation Code or International Residential Code as they relate to new construction only.

(CHAPTER 10 CHANGE OF OCCUPANCY
SECTION 1001 GENERAL)

SECTION 3409
CHANGE OF OCCUPANCY

3409.1 Scope. The provisions of this section shall apply where a change of occupancy occurs, as defined in Section 202, including:

1. Where the occupancy classification is not changed; or
2. Where there is a change in occupancy classification or the occupancy group designation changes.

3409.2 Change in occupancy with no change of occupancy classification. A change in occupancy, as defined in Section 202, with no change of occupancy classification shall not be made to any structure that will subject the structure to any special provisions of the applicable International Codes, including the provisions of Sections 3409.5 through 3409.14, without the approval of the code official. A certificate of occupancy shall be issued where it has been determined that the requirements for the change in occupancy have been met.

3409.2.1 Repair and alteration with no change of occupancy classification. Any repair or alteration work undertaken in connection with a change of occupancy that does not involve a change of occupancy classification shall conform to the applicable requirements for the work as classified in Chapter 4 and to the requirements of Sections 3409.5 through 3409.14.

Exception: As modified in Section 3411.8 for historic buildings.

3409.3 Change of occupancy classification. Where the occupancy classification of a building changes, the provisions of Sections 3409.5 through 3409.15 shall apply. This includes a change of occupancy classification within a group as well as a change of occupancy classification from one group to a different group.

3409.3.1 Partial change of occupancy classification. Where a portion of an existing building is changed to a new occupancy classification, Section 3409.15 shall apply.

3409.4 Certificate of occupancy required. A certificate of occupancy shall be issued where a change of occupancy occurs that results in a different occupancy classification as determined by the International Building Code.

(SECTION 1002 SPECIAL USE AND OCCUPANCY)

3409.5 Special use and occupancy. Where the character or use of an existing building or part of an existing building is changed to one of the following special use or occupancy categories as defined in the

International Building Code, the building shall comply with all of the applicable requirements of the International Building Code:

1. Covered and open mall buildings.
2. Atriums.
3. Motor vehicle-related occupancies.
4. Aircraft-related occupancies.
5. Motion picture projection rooms.
6. Stages and platforms.
7. Special amusement buildings.
8. Incidental use areas.
9. Hazardous materials.
10. Ambulatory care facilities.

3409.5.1 Underground buildings. An underground building in which there is a change of use shall comply with the requirements of the International Building Code applicable to underground structures.

(SECTION 1003 BUILDING ELEMENTS AND MATERIALS

3409.6 Building elements and materials. Building elements and materials in portions of buildings undergoing a change of occupancy classification shall comply with Section 3409.15.

(SECTION 1004 FIRE PROTECTION)

3409.7 Fire protection. Fire protection requirements of Section 3409.15 shall apply where a building or portions thereof undergo a change of occupancy classification.

(SECTION 1005 MEANS OF EGRESS)

3409.8 Means of egress. Means of egress in portions of buildings undergoing a change of occupancy classification shall comply with Section 3409.15.

(SECTION 1006 ACCESSIBILITY)

3409.9 Accessibility. Accessibility in portions of buildings undergoing a change of occupancy classification shall comply with Section 3407.9.8.

(SECTION 1007 STRUCTURAL)

3409.10 Structural. Structural requirements for buildings undergoing a change of occupancy shall comply with this section.

3409.10.1 Gravity loads. Buildings or portions thereof subject to a change of occupancy where such change in the nature of occupancy results in higher uniform or concentrated loads based on Table 1607.1 of the International Building Code shall comply with the gravity load provisions of the International Building Code.

Exception: Structural elements whose stress is not increased by more than 5 percent.

3409.10.2 Snow and wind loads. Buildings and structures subject to a change of occupancy where such change in the nature of occupancy results in higher wind or snow risk categories based on Table 1607.1 of the International Building Code shall be analyzed and shall comply with the applicable wind or snow load provisions of the International Building Code.

Exception: Where the new occupancy with a higher risk category is less than or equal to 10 percent of the total building floor area. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.

3409.10.2 Seismic loads. Existing buildings with a change of occupancy shall comply with the seismic provisions of Sections 3409.10.2.1 and 3409.10.2.2.

3409.10.2.1 Compliance with the International Building Code level seismic forces. Where a building or portion thereof is subject to a change of occupancy that results in the building being assigned to a higher risk category based on Table 1604.5 of the International Building Code; or where such change of occupancy results in a reclassification of a building to a higher hazard category as shown in Table 3409.15.4; or where a change of a Group M occupancy to a Group A, E, I-1, R-1, R-2 or R-4 occupancy with two-thirds or more of the floors involved in Level 3 alteration work, the building shall comply with the requirements for International Building Code level seismic forces as specified in Section 301.1.4.1 for the new risk category.

Exceptions:

1. Group M occupancies being changed to Group A, E, I-1, R-1, R-2 or R-4 occupancies for buildings less than six stories in height and in Seismic Design Category A, B or C.
2. Where approved by the code official, specific detailing provisions required for a new structure are not required to be met where it can be shown that an equivalent level of performance and seismic safety is obtained for the applicable risk category based on the provision for reduced International Building Code level seismic forces as specified in Section 3401.6.4.4.
3. Where the area of the new occupancy with a higher hazard category is less than or equal to 10 percent of the total building floor area and the new occupancy is not classified as Risk Category IV. For the purposes of this exception, buildings occupied by two or more occupancies not included in the same Risk category, shall be subject to the provisions of Section 1604.5.1 of the International Building Code. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.
4. Unreinforced masonry bearing wall buildings in Risk Category III when assigned to Seismic Design Category A or B shall be allowed to be strengthened to meet the requirements of Appendix Chapter A1 of this code [Guidelines for the Seismic Retrofit of Existing Buildings (GSREB)].

3409.10.2.2 Access to Risk Category IV. Where a change of occupancy is such that compliance with Section 3409.10.2.1 is required and the building is assigned to Risk Category IV, the operational access to the building shall not be through an adjacent structure, unless that structure conforms to the requirements for Risk Category IV structures. Where operational access is less than 10 feet (3048 mm) from either an interior lot line or from another structure, access protection from potential falling debris shall be provided by the owner of the Risk Category IV structure.

(SECTION 1008 ELECTRICAL)

3409.11 Electrical. Buildings undergoing a change occupancy shall comply with this Section.

3409.11.1 Special occupancies. Where the occupancy of an existing building or part of an existing building is changed to one of the following special occupancies as described in NFPA 70, the electrical wiring and equipment of the building or portion thereof that contains the proposed occupancy shall comply with the applicable requirements of NFPA 70 whether or not a change of occupancy group is involved:

1. Hazardous locations.
2. Commercial garages, repair, and storage.
3. Aircraft hangars.
4. Gasoline dispensing and service stations.

5. Bulk storage plants.
6. Spray application, dipping, and coating processes.
7. Health care facilities.
8. Places of assembly.
9. Theaters, audience areas of motion picture and television studios, and similar locations.
10. Motion picture and television studios and similar locations.
11. Motion picture projectors.
12. Agricultural buildings.

3409.11.2 Unsafe conditions. Where the occupancy of an existing building or part of an existing building is changed, all unsafe conditions shall be corrected without requiring that all parts of the electrical system comply with NFPA 70.

3409.11.3 Service upgrade. Where the occupancy of an existing building or part of an existing building is changed, electrical service shall be upgraded to meet the requirements of NFPA 70 for the new occupancy.

3409.11.4 Number of electrical outlets. Where the occupancy of an existing building or part of an existing building is changed, the number of electrical outlets shall comply with NFPA 70 for the new occupancy.

(SECTION 1009 MECHANICAL)

3409.12 Mechanical requirements. Where the occupancy of an existing building or part of an existing building is changed such that the new occupancy is subject to different kitchen exhaust requirements or to increased mechanical ventilation requirements in accordance with the International Mechanical Code, the new occupancy shall comply with the intent of the respective International Mechanical Code provisions.

(SECTION 1010 PLUMBING)

3409.13. Plumbing. Buildings undergoing a change of occupancy shall comply with plumbing requirements of this section.

3409.13.1 Increased demand. Where the occupancy of an existing building or part of an existing building is changed such that the new occupancy is subject to increased or different plumbing fixture requirements or to increased water supply requirements in accordance with the International Plumbing Code, the new occupancy shall comply with the intent of the respective International Plumbing Code provisions.

3409.13.2 Food-handling occupancies. If the new occupancy is a food-handling establishment, all existing sanitary waste lines above the food or drink preparation or storage areas shall be panned or otherwise protected to prevent leaking pipes or condensation on pipes from contaminating food or drink. New drainage lines shall not be installed above such areas and shall be protected in accordance with the International Plumbing Code.

3409.13.3 Interceptor required. If the new occupancy will produce grease or oil-laden wastes, interceptors shall be provided as required in the International Plumbing Code.

3409.13.4 Chemical wastes. If the new occupancy will produce chemical wastes, the following shall apply:

1. If the existing piping is not compatible with the chemical waste, the waste shall be neutralized prior to entering the drainage system, or the piping shall be changed to a compatible material.
2. No chemical waste shall discharge to a public sewer system without the approval of the sewage authority.

3409.13.5 Group I-2. If the occupancy group is changed to Group I-2, the plumbing system shall comply with the applicable requirements of the International Plumbing Code.

(SECTION 1011 OTHER REQUIREMENTS)

3409.14 Light and ventilation. Light and ventilation shall comply with the requirements of the International Building Code for the new occupancy.

(SECTION 1012 CHANGE OF OCCUPANCY CLASSIFICATION)

3409.15 Change of occupancy classification. Buildings undergoing a change of occupancy classification shall comply with this section.

3409.15.1 General. The provisions of this section shall apply to buildings or portions thereof undergoing a change of occupancy classification. This includes a change of occupancy classification within a group as well as a change of occupancy classification from one group to a different group. Such buildings shall also comply with Sections 3409.5 through 3409.14. The application of requirements for the change of occupancy shall be as set forth in Sections 3409.15.1.1 through 3409.15.1.4. A change of occupancy, as defined in Section 202, without a corresponding change of occupancy classification shall comply with Section 3409.2.

3409.15.1.1 Compliance with Section 3408. The requirements of Section 3405.1 shall be applicable throughout the building for the new occupancy classification based on the separation conditions set forth in Sections 3409.15.1.1.1 and 3409.15.1.1.2.

3409.15.1.1.1 Change of occupancy classification without separation. Where a portion of an existing building is changed to a new occupancy classification and that portion is not separated from the remainder of the building with fire barriers having a fire-resistance rating as required in the International Building Code for the separate occupancy, the entire building shall comply with all of the requirements of Section 3408 applied throughout the building for the most restrictive occupancy classification in the building and with the requirements of this chapter.

3409.15.1.1.2 Change of occupancy classification with separation. Where a portion of an existing building that is changed to a new occupancy classification and that portion is separated from the remainder of the building with fire barriers having a fire-resistance rating as required in the International Building Code for the separate occupancy, that portion shall comply with all of the requirements of Section 3408 for the new occupancy classification and with the requirements of this chapter.

3409.15.1.2 Fire protection and interior finish. The provisions of Sections 3409.15.2 and 3409.15.3 for fire protection and interior finish, respectively, shall apply to all buildings undergoing a change of occupancy classification.

3409.15.1.3 Change of occupancy classification based on hazard category. The relative degree of hazard between different occupancy classifications shall be determined in accordance with the categories specified in Tables 3409.15.4, 3409.15.5 and 3415.6. Such a determination shall be the basis for the application of Sections 3409.15.4 through 3409.15.7.

3409.15.1.4 Accessibility. All buildings undergoing a change of occupancy classification shall comply with Section 3409.15.8.

3409.15.2 Fire protection systems. Fire protection systems shall be provided in accordance with Sections 3409.15.2.1 and 3409.15.2.2.

3409.15.2.1 Fire sprinkler system. Where a change in occupancy classification occurs that requires an automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9, such system shall be provided throughout the area where the change of occupancy occurs.

3409.15.2.2 Fire alarm and detection system. Where a change in occupancy classification occurs that requires a fire alarm and detection system to be provided based on the new occupancy in accordance with Chapter 9, such system shall be provided throughout the area where the change of occupancy occurs. Existing alarm notification appliances shall be automatically activated throughout the building. Where the building is not equipped with a fire alarm system, alarm notification appliances shall be provided throughout the area where the change of occupancy occurs and shall be automatically activated.

3409.15.3 Interior finish. In areas of the building undergoing the change of occupancy classification, the interior finish of walls and ceilings shall comply with the requirements of the International Building Code for the new occupancy classification.

3409.15.4 Means of egress, general. Hazard categories in regard to life safety and means of egress shall be in accordance with Table 3409.15.4.

TABLE 3409.15.4 (IEBC TABLE 1012.4)
MEANS OF EGRESS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	I-2, I-3, I-4
3	A, E, I-1, M, R-1, R-2, R-4
4	B, F-1, R-3, S-1
5 (Lowest Hazard)	F-2, S-2, U

3409.15.4.1 Means of egress for change to higher hazard category. When a change of occupancy classification is made to a higher hazard category (lower number) as shown in Table 3409.15.4, the means of egress shall comply with the requirements of Chapter 10..

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 3408.4.1.
2. Existing stairways including handrails and guards complying with the requirements of Section 3408 shall be permitted for continued use subject to approval of the code official.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed on both sides of wood lath and plaster in good condition or 1/2-inch-thick (12.7 mm) gypsum wallboard shall be permitted. Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.
5. Existing corridor doorways, transoms and other corridor openings shall comply with the requirements in Sections 3407.5.5.1, 3407.5.5.2 and 3407.5.5.3, .
6. Existing dead-end corridors shall comply with the requirements in Section 3407.5.6.
7. An existing operable window with clear opening area no less than 4 square feet (0.38 m2) and minimum opening height and width of 22 inches (559 mm) and 20 inches (508 mm), respectively, shall be accepted as an emergency escape and rescue opening.

3409.15.4.2 Means of egress for change of use to equal or lower hazard category. When a change of occupancy classification is made to an equal or lesser hazard category (higher number) as shown in Table 3409.15.4, existing elements of the means of egress shall comply with the requirements of Section 3407.15.4 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10.

> **Exception:** Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.

3409.15.4.3 Egress capacity. Egress capacity shall meet or exceed the occupant load as specified in Chapter 10 for the new occupancy.

3409.15.4.4 Handrails. Existing stairways shall comply with the handrail requirements of Section 3407.5.9 in the area of the change of occupancy classification.

3409.15.4.5 Guards. Existing guards shall comply with the requirements in Section 3407.5.10 in the area of the change of occupancy classification.

3409.15.5 Heights and areas. Hazard categories in regard to height and area shall be in accordance with Table 3409.15.5.

TABLE 3409.15.5 (IEBC TABLE 1012.5)
HEIGHTS AND AREAS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	A-1, A-2, A-3, A-4, I, R-1, R-2, R-4
3	E, F-1, S-1, M
4 (Lowest Hazard)	B, F-2, S-2, A-5, R-3, U

3409.15.5.1 Height and area for change to higher hazard category. When a change of occupancy classification is made to a higher hazard category as shown in Table 3409.15.5, heights and areas of buildings and structures shall comply with the requirements of Chapter 5 for the new occupancy classification.

> **Exception:** In other than Groups H, F-1 and S-1, in lieu of fire walls, use of fire barriers having a fire-resistance rating of not less than that specified in Table 706.4, constructed in accordance with Section 707, shall be permitted to meet area limitations required for the new occupancy in buildings protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

3409.15.5.1.1 Fire wall alternative. In other than Groups H, F-1 and S-1, fire barriers and horizontal assemblies constructed in accordance with Sections 707 and 711, respectively, shall be permitted to be used in lieu of fire walls to subdivide the building into separate buildings for the purpose of complying with the area limitations required for the new occupancy where all of the following conditions are met:

1. The buildings are protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. The maximum allowable area between fire barriers, horizontal assemblies, or any combination thereof shall not exceed the maximum allowable area determined in accordance with Chapter 5 without an increase allowed for an automatic sprinkler system in accordance with Section 506.
3. The fire-resistance rating of the fire barriers and horizontal assemblies shall not be less than that specified for fire walls in Table 706.4.

> **Exception:** Where horizontal assemblies are used to limit the maximum allowable area, the required fire resistance rating of the horizontal assemblies shall be permitted to be reduced by 1 hour provided

the height and number of stories increases allowed for an automatic sprinkler system by Section 504.2 are not used for the buildings.

3409.15.5.2 Height and area for change to equal or lesser hazard category. When a change of occupancy classification is made to an equal or lesser hazard category as shown in Table 3409.15.5, the height and area of the existing building shall be deemed acceptable.

3409.15.5.3 Fire barriers. When a change of occupancy classification is made to a higher hazard category as shown in Table 3409.15.5, fire barriers in separated mixed use buildings shall comply with the fire-resistance requirements of the International Building Code.

Exception: Where the fire barriers are required to have a 1-hour fire-resistance rating, existing wood lath and plaster in good condition or existing 1/2-inch-thick (12.7 mm) gypsum wallboard shall be permitted.

3409.15.6 Exterior wall fire-resistance ratings. Hazard categories in regard to fire-resistance ratings of exterior walls shall be in accordance with Table 3409.15.6.

TABLE 3409.15.6 (IEBC TABLE 1012.6)
EXPOSURE OF EXTERIOR WALLS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	**H**
2	F-1, M, S-1
3	A, B, E, I, R
4 (Lowest Hazard)	F-2, S-2, U

3409.15.6.1 Exterior wall rating for change of occupancy classification to a higher hazard category. When a change of occupancy classification is made to a higher hazard category as shown in Table 3409.15.6, exterior walls shall have fire resistance and exterior opening protectives as required by the International Building Code.

Exception: A 2-hour fire-resistance rating shall be allowed where the building does not exceed three stories in height and is classified as one of the following groups: A-2 and A-3 with an occupant load of less than 300, B, F, M or S.

3409.15.6.2 Exterior wall rating for change of occupancy classification to an equal or lesser hazard category. When a change of occupancy classification is made to an equal or lesser hazard category as shown in Table 3409.15.6, existing exterior walls, including openings, shall be accepted.

3409.15.6.3 Opening protectives. Openings in exterior walls shall be protected as required by the International Building Code. Where openings in the exterior walls are required to be protected because of their distance from the lot line, the sum of the area of such openings shall not exceed 50 percent of the total area of the wall in each story.

Exceptions:

1. Where the International Building Code permits openings in excess of 50 percent.
2. Protected openings shall not be required in buildings of Group R occupancy that do not exceed three stories in height and that are located not less than 3 feet (914 mm) from the lot line.
3. Where exterior opening protectives are required, an automatic sprinkler system throughout may be substituted for opening protection.
4. Exterior opening protectives are not required when the change of occupancy group is to an equal or lower hazard classification in accordance with Table 3409.15.6.

3409.15.7 Enclosure of vertical shafts. Enclosure of vertical shafts shall be in accordance with Sections 3409.15.7.1 through 3409.15.7.4.

3409.15.7.1 Minimum requirements. Vertical shafts shall be designed to meet the International Building Code requirements for atriums or the requirements of this section.

3409.15.7.2 Stairways. When a change of occupancy classification is made to a higher hazard category as shown in Table 3409.15.4, interior stairways shall be enclosed as required by the International Building Code.

Exceptions:

1. In other than Group I occupancies, an enclosure shall not be required for openings serving only one adjacent floor and that are not connected with corridors or stairways serving other floors.
2. Unenclosed existing stairways need not be enclosed in a continuous vertical shaft if each story is separated from other stories by 1-hour fire-resistance-rated construction or approved wired glass set in steel frames and all exit corridors are sprinklered. The openings between the corridor and the occupant space shall have at least one sprinkler head above the openings on the tenant side. The sprinkler system shall be permitted to be supplied from the domestic watersupply systems, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.
3. Existing penetrations of stairway enclosures shall be accepted if they are protected in accordance with Chapter 7.

3409.15.7.3 Other vertical shafts. Interior vertical shafts other than stairways, including but not limited to elevator hoistways and service and utility shafts, shall be enclosed as required by the International Building Code when there is a change of use to a higher hazard category as specified in Table 3409.15.4.

Exceptions:

1. Existing 1-hour interior shaft enclosures shall be accepted where a higher rating is required.
2. Vertical openings, other than stairways, in buildings of other than Group I occupancy and connecting less than six stories shall not be required to be enclosed if the entire building is provided with an approved automatic sprinkler system.

3409.15.7.4 Openings. All openings into existing vertical shaft enclosures shall be protected by fire assemblies having a fire protection rating of not less than 1 hour and shall be maintained self-closing or shall be automatic-closing by actuation of a smoke detector. All other openings shall be fire protected in an approved manner. Existing fusible link-type automatic door-closing devices shall be permitted in all shafts except stairways if the fusible link rating does not exceed 135°F (57°C).

3409.15.8 Accessibility. Existing buildings that undergo a change of group or occupancy classification shall comply with this section.

Exception: Type B dwelling or sleeping units required by Section 1107 are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with less than a Level 3 alteration.

3409.15.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alteration shall comply with Sections 3406.1.2, 3407.6 and 3408.7, as applicable.

3409.15.8.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3409.15.8.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Exception: The accessible features listed in Items 1 through 6 are not required for an accessible route to Type B units.

*(CHAPTER 11 ADDITIONS
SECTION 1101 GENERAL)*

**SECTION 3410
ADDITIONS**

3410.1 Scope. An addition to a building or structure shall comply with the International Codes as adopted for new construction without requiring the existing building or structure to comply with any requirements of those codes or of these provisions, except as required by this chapter. Where an addition impacts the existing building or structure, that portion shall comply with this code.

3410.2 Creation or extension of nonconformity. An addition shall not create or extend any nonconformity in the existing building to which the addition is being made with regard to accessibility, structural strength, fire safety, means of egress, or the capacity of mechanical, plumbing, or electrical systems.

3410.3 Other work. Any repair or alteration work within an existing building to which an addition is being made shall comply with the applicable requirements for the work as classified.

(SECTION 1102 HEIGHTS AND AREAS)

3410.4 Height and areas. Heights and areas in buildings undergoing an addition shall be in accordance with Section 3410.4.1 through 3410.4.3.

3410.4.1 Height limitations. No addition shall increase the height of an existing building beyond that permitted under the applicable provisions of Chapter 5 for new buildings.

3410.4.2 Area limitations. No addition shall increase the area of an existing building beyond that permitted under the applicable provisions of Chapter 5 for new buildings unless fire separation as required by the International Building Code is provided.

Exception: In-filling of floor openings and nonoccupiable appendages such as elevator and exit stair shafts shall be permitted beyond that permitted by this code for new construction.

3410.4.3 Fire protection systems. Existing fire areas increased by the addition shall comply with Chapter 9.

(SECTION 1103 STRUCTURAL)

3410.5 Structural. Structural requirements for additions shall comply with Sections 3410.5.1 through 3410.5.5.

3410.5.1 Compliance with the International Building Code. Additions to existing buildings or structures are new construction and shall comply with the International Building Code.

3410.5.2 Additional gravity loads. Existing structural elements supporting any additional gravity loads as a result of additions shall comply with the International Building Code.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with no more than five dwelling units or sleeping units used solely for residential purposes where the existing building and the addition comply with the conventional light- frame construction methods of the International Building Code or the provisions of the International Residential Code.

3405.3 Lateral force-resisting system. The lateral force-resisting system of existing buildings to which additions are made shall comply with Sections 3410.5.3.1, 3410.5.3.2 and 3410.5.3.3.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes where the existing building and the addition comply with the conventional light-frame construction methods of the International Building Code or the provisions of the International Residential Code.
2. In other existing buildings where the lateral-force story shear in any story is not increased by more than 10 percent cumulative.

3410.5.3.1 Vertical addition. Any element of the lateral force-resisting system of an existing building subjected to an increase in vertical or lateral loads from the vertical addition shall comply with the International Building Code wind provisions and the IBC-level seismic forces specified in Section 301.1.4.1 of this code.

3410.5.3.2 Horizontal addition. Where horizontal additions are structurally connected to an existing structure, all lateral force-resisting elements of the existing structure affected by such addition shall comply with the International Building Code wind provisions and the IBC-level seismic forces specified in Section 301.1.4.1 of this code.

3410.5.3.3 Voluntary addition of structural elements to improve the lateral force-resisting system. Voluntary addition of structural elements to improve the lateral force-resisting system of an existing building shall comply with Section 3407.7.5.

3410.5.4 Snow drift loads. Any structural element of an existing building subjected to additional loads from the effects of snow drift as a result of an addition shall comply Chapter 16.

Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.
2. Buildings of Group R occupancy with no more than five dwelling units or sleeping units used solely for residential purposes where the existing building and the addition comply with the conventional light- frame construction methods of Section 2308 or the provisions of the International Residential Code.

3410.5.5 Flood hazard areas. Additions and foundations in flood hazard areas shall comply with the following requirements:

1. For horizontal additions that are structurally interconnected to the existing building:
    1.1. If the addition and all other proposed work, when combined, constitute substantial improvement, the existing building and the addition shall comply with Section 1612 of the International Building Code.
    1.2. If the addition constitutes substantial improvement, the existing building and the addition shall comply with Section 1612 of the International Building Code.
2. For horizontal additions that are not structurally interconnected to the existing building:
    2.1. The addition shall comply with Section 1612 of the International Building Code.
    2.2. If the addition and all other proposed work, when combined, constitute substantial improvement, the existing building and the addition shall comply with Section 1612 of the International Building Code.
3. For vertical additions and all other proposed work that, when combined, constitute substantial improvement, the existing building shall comply with Section 1612 of the International Building Code.
4. For a new, replacement, raised, or extended foundation, if the foundation work and all other proposed work, when combined, constitute substantial improvement, the existing building shall comply with Section 1612 of the International Building Code.

(SECTION 1104 SMOKE ALARMS IN OCCUPANCY GROUPS R AND I-1)

3410.6 Smoke alarms in existing portions of a building. Where an addition is made to a building or structure of a Group R or I-1 occupancy, the existing building shall be provided with smoke alarms as required by Section 1103.8 of the International Fire Code or Section R314 of the International Residential Code as applicable.

(SECTION 1105 ACCESSIBILITY)

3410.7 Accessibility. Accessibility provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, primary function shall comply with the requirements of Sections 3406.1.2, 3407.6 and 3408.7, as applicable.

(SECTION 1106 ENERGY CONSERVATION)

3410.8 Energy conservation. Additions to existing buildings shall conform to the energy requirements of the International Energy Conservation Code or International Residential Code as they relate to new construction.

(CHAPTER 12 HISTORIC BUILDINGS
SECTION 1201GENERAL)

SECTION 3411
HISTORIC BUILDINGS

3411.1 Scope. It is the intent of this chapter to provide means for the preservation of historic buildings. Historical buildings shall comply with the provisions of this chapter relating to their repair, alteration, relocation and change of occupancy.

3411.2 Report. A historic building undergoing repair, alteration, or change of occupancy shall be investigated and evaluated. If it is intended that the building meet the requirements of this chapter, a written report shall be prepared and filed with the code official by a registered design professional when such a report is necessary in the opinion of the code official. Such report shall be in accordance with Chapter 1 and shall identify each required safety feature that is in compliance with this chapter and where compliance with other chapters of these provisions would be damaging to the contributing historic features. For buildings assigned to Seismic Design Category D, E or F, a structural evaluation describing, at a minimum, the vertical and horizontal elements of the lateral force-resisting system and any strengths or weaknesses therein shall be prepared. Additionally, the report shall describe each feature that is not in compliance with these provisions and shall demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety.

3411.3 Special occupancy exceptions—museums. When a building in Group R-3 is also used for Group A, B, or M purposes such as museum tours, exhibits, and other public assembly activities, or for museums less than 3,000 square feet (279 m2), the code official may determine that the occupancy is Group B when life-safety conditions can be demonstrated in accordance with Section 3411.2. Adequate means of egress in such buildings, which may include a means of maintaining doors in an open position to permit egress, a limit on building occupancy to an occupant load permitted by the means of egress capacity, a limit on occupancy of certain areas or floors, or supervision by a person knowledgeable in the emergency exiting procedures, shall be provided.

3411.4 Flood hazard areas. In flood hazard areas, if all proposed work, including repairs, work required because of a change of occupancy, and alterations, constitutes substantial improvement, then the existing building shall comply with Section 1612 of the International Building Code.

Exception: If an historic building will continue to be an historic building after the proposed work is completed, then the proposed work is not considered a substantial improvement. For the purposes of this exception, an historic building is:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;
2. Determined by the Secretary of the U.S. Department of Interior to contribute to the historical significance of a registered historic district or a district preliminarily determined to qualify as a historic district; or
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

(SECTION 1202 REPAIRS)

3411.5 Repairs. Repairs to historic buildings shall be in accordance with Sections 3411.5.1 through 3411.5.4.

3411.5.1 General. Repairs to any portion of an historic building or structure shall be permitted with original or like materials and original methods of construction, subject to the provisions of this chapter. Hazardous materials, such as asbestos and lead-based paint, shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

3411.5.2 Unsafe conditions. Conditions determined by the code official to be unsafe shall be remedied. No work shall be required beyond what is required to remedy the unsafe conditions.

3411.5.3 Relocated buildings. Foundations of relocated historic buildings and structures shall comply with the International Building Code. Relocated historic buildings shall otherwise be considered an historic building for the purposes of this code. Relocated historic buildings and structures shall be sited so that exterior wall and opening requirements comply with the International Building Code or with the compliance alternatives of this code.

3411.5.4 Replacement. Replacement of existing or missing features using original materials shall be permitted. Partial replacement for repairs that match the original in configuration, height, and size shall be permitted.

Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24.

Exception: Glass block walls, louvered windows, and jalousies repaired with like materials.

(SECTION 1203 FIRE SAFETY)

3411.6 Scope. Historic buildings undergoing alterations, changes of occupancy, or that are moved shall comply with this section.

3411.6.2 General. Every historic building that does not conform to the construction requirements specified in this code for the occupancy or use and that constitutes a distinct fire hazard as defined herein shall be provided with an approved automatic fire-extinguishing system as determined appropriate by the code official. However, an automatic fire-extinguishing system shall not be used to substitute for, or act as an alternative to, the required number of exits from any facility.

3411.6.3 Means of egress. Existing door openings and corridor and stairway widths less than those specified elsewhere in this code may be approved, provided that, in the opinion of the code official, there is sufficient width and height for a person to pass through the opening or traverse the means of egress. When approved by the code official, the front or main exit doors need not swing in the direction of the path of exit travel, provided that other approved means of egress having sufficient capacity to serve the total occupant load are provided.

3411.6.4 Transoms. In fully sprinklered buildings of Group R-1, R-2 or R-3 occupancy, existing transoms in corridors and other fire-resistance-rated walls may be maintained if fixed in the closed position. A sprinkler shall be installed on each side of the transom.

3411.6.5 Interior finishes. The existing finishes of walls and ceilings shall be accepted when it is demonstrated that they are the historic finishes.

3411.6.6 Stairway enclosure. In buildings of three stories or less, exit enclosure construction shall limit the spread of smoke by the use of tight-fitting doors and solid elements. Such elements are not required to have a fire-resistance rating.

3411.6.7 One-hour fire-resistant assemblies. Where 1-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood or metal lath and plaster.

3411.6.8 Glazing in fire-resistance-rated systems. Historic glazing materials are permitted in interior walls required to have a 1-hour fire-resistance rating where the opening is provided with approved smoke seals and the area affected is provided with an automatic sprinkler system.

3411.6.9 Stairway railings. Grand stairways shall be accepted without complying with the handrail and guard requirements. Existing handrails and guards at all stairs shall be permitted to remain, provided they are not structurally dangerous.

3411.6.10 Guards. Guards shall comply with Sections 3411.6.10.1 and 3411.6.10.2.

3411.6.10.1 Height. Existing guards shall comply with the requirements of Section 3405.1.

3411.6.10.2 Guard openings. The spacing between existing intermediate railings or openings in existing ornamental patterns shall be accepted. Missing elements or members of a guard may be replaced in a manner that will preserve the historic appearance of the building or structure.

3411.6.11 Exit signs. Where exit sign or egress path marking location would damage the historic character of the building, alternative exit signs are permitted with approval of the code official. Alternative signs shall identify the exits and egress path.

3411.6.12 Automatic fire-extinguishing systems. Every historical building that cannot be made to conform to the construction requirements specified in the International Building Code for the occupancy or use and that constitutes a distinct fire hazard shall be deemed to be in compliance if provided with an approved automatic fire-extinguishing system.

Exception: When the code official approves an alternative life-safety system.

(SECTION 1204 ALTERATIONS)

3411.7 Alterations. Alterations to historic buildings shall be in accordance with this section.

3411.7.1 Accessibility requirements. The provisions of Sections 3406.1.2, 3407.6 and 3408.7, as applicable, shall apply to facilities designated as historic structures that undergo alterations, unless technically infeasible. Where compliance with the requirements for accessible routes, entrances or toilet rooms would threaten or destroy the historic significance of the building or facility, as determined by the code official, the alternative requirements of Sections 3411.7.1.1 through 3411.7.1.4 for that element shall be permitted.

Exception: Type B dwelling or sleeping units required by Section 1107 of the International Building Code are not required to be provided in historical buildings.

3411.7.1.1 Site arrival points. At least one main entrance shall be accessible.

3411.7.1.2 Multilevel buildings and facilities. An accessible route from an accessible entrance to public spaces on the level of the accessible entrance shall be provided.

3411.7.1.3 Entrances. At least one main entrance shall be accessible.

Exceptions:

1. If a main entrance cannot be made accessible, an accessible nonpublic entrance that is unlocked while the building is occupied shall be provided; or
2. If a main entrance cannot be made accessible, a locked accessible entrance with a notification system or remote monitoring shall be provided.

3411.7.1.4 Toilet and bathing facilities. Where toilet rooms are provided, at least one accessible family or assisted-use toilet room complying with Section 1109.2.1 shall be provided.

(SECTION 1205 CHANGE OF OCCUPANCY)

3411.8 Change of Occupancy. Historic buildings undergoing a change of occupancy shall be in accordance with this Sections 3411.8.1 through 3411.8.15.

3411.8.1 General. Historic buildings undergoing a change of occupancy shall comply with the applicable provisions of Section 3409, except as specifically permitted in this chapter. When Section 3409 requires compliance with specific requirements of Sections 3406, 3407 or 3408 and when those requirements are subject to the exceptions in Section 3410.4, the same exceptions shall apply to this section.

3411.8.2 Building area. The allowable floor area for historic buildings undergoing a change of occupancy shall be permitted to exceed by 20 percent the allowable areas specified in Chapter 5.

3411.8.3 Location on property. Historic structures undergoing a change of use to a higher hazard category in accordance with Section 3409.15.6 may use alternative methods to comply with the fire-resistance and exterior opening protective requirements. Such alternatives shall comply with Section 3411.2.

3411.8.4 Occupancy separation. Required occupancy separations of 1 hour may be omitted when the building is provided with an approved automatic sprinkler system throughout.

3411.8.5 Roof covering. Regardless of occupancy or use group, roof-covering materials not less than Class C shall be permitted where a fire-retardant roof covering is required.

3411.8.6 Means of egress. Existing door openings and corridor and stairway widths less than those that would be acceptable for nonhistoric buildings under these provisions shall be approved, provided that, in the opinion of the code official, there is sufficient width and height for a person to pass through the opening or traverse the exit and that the capacity of the exit system is adequate for the occupant load, or where other operational controls to limit occupancy are approved by the code official.

3411.8.7 Door swing. When approved by the code official, existing front doors need not swing in the direction of exit travel, provided that other approved exits having sufficient capacity to serve the total occupant load are provided.

3411.8.8 Transoms. In corridor walls required by these provisions to be fire-resistance rated, existing transoms may be maintained if fixed in the closed position, and fixed wired glass set in a steel frame or other approved glazing shall be installed on one side of the transom.

> **Exception:** Transoms conforming to Section 3411.6.4 shall be accepted.

3411.8.9 Finishes. Where interior finish materials are required to have a flame spread index of Class C or better, existing nonconforming materials shall be surfaced with approved fire-retardant paint or finish.

> **Exception:** Existing nonconforming materials need not be surfaced with an approved fire-retardant paint or finish where the building is equipped throughout with an automatic sprinkler system installed in accordance with the International Building Code and the nonconforming materials can be substantiated as being historic in character.

3411.8.10 One-hour fire-resistant assemblies. Where 1-hour fire-resistance-rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood lath and plaster.

3411.8.11 Stairs and railings. Existing stairways shall comply with the requirements of these provisions. The code official shall grant alternatives for stairways and railings if alternative stairways are found to be acceptable or are judged to meet the intent of these provisions. Existing stairways shall comply with Section 3411.6.

> **Exception:** For buildings less than 3,000 square feet (279 m2), existing conditions are permitted to remain at all stairs and rails.

3411.8.12 Exit signs. The code official may accept alternative exit sign locations where such signs would damage the historic character of the building or structure. Such signs shall identify the exits and exit path.

3411.8.13 Exit stair live load. Existing historic stairways in buildings changed to a Group R-1 or R-2 occupancy shall be accepted where it can be shown that the stairway can support a 75-pounds-per-square-foot (366 kg/m2) live load.

3411.8.14 Natural light. When it is determined by the code official that compliance with the natural light requirements of Section 3409.14 will lead to loss of historic character or historic materials in the building, the existing level of natural lighting shall be considered acceptable.

3411.8.15 Accessibility requirements. The provisions of Section 3409.15.8 shall apply to facilities designated as historic structures that undergo a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet rooms would threaten or destroy the historic significance of the building or facility, as determined by the authority having jurisdiction, the alternative requirements of Sections 3411.7.1.1 through 3411.7.1.4 for those elements shall be permitted.

Exception: Type B dwelling or sleeping units required by Section 1107.

(SECTION 1206 STRUCTURAL)

3411.9 Historic. Historic buildings shall comply with the requirements for repairs, Level1,2 or 3 alterations or additions as applicable.

Exception: The code official shall be authorized to accept existing floors and approve operational controls that limit the live load on any such floor.

3411.9.2 Dangerous conditions. Conditions determined by the code official to be dangerous shall be remedied. No work shall be required beyond what is required to remedy the dangerous condition.

*(CHAPTER 13 RELOCATED OR MOVED BUILDINGS
SECTION 1301GENERAL)*

**SECTION 3412
RELOCATED OR MOVED BUILDINGS**

3412.1 Scope. This section provides requirements for relocated or moved structures.

3412.1.1 Conformance. The building shall be safe for human occupancy as determined by the International Fire Code and the International Property Maintenance Code. Any repair, alteration, or change of occupancy undertaken within the moved structure shall comply with the requirements of this code applicable to the work being performed. Any field-fabricated elements shall comply with the requirements of the International Building Code or the International Residential Code as applicable.

(SECTION 1302 REQUIREMENTS)

3412.1.2 Location on the lot. The building shall be located on the lot in accordance with the requirements of this code or the International Residential Code as applicable.

3412.1.3 Foundation. The foundation system of relocated buildings shall comply with this code or the International Residential Code as applicable.

3412.1.3.1 Connection to the foundation. The connection of the relocated building to the foundation shall comply with this code or the International Residential Code as applicable.

3412.1.4 Wind loads. Buildings shall comply with this code or International Residential Code wind provisions as applicable.

Exceptions:

1. Detached one- and two-family dwellings and Group U occupancies where wind loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than 10 percent.

3412.1.5 Seismic loads. Buildings shall comply with this code or International Residential Code seismic provisions at the new location as applicable.

Exceptions:

1. Structures in Seismic Design Categories A and B and detached one- and two-family dwellings in Seismic Design Categories A, B and C where the seismic loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than 10 percent.

3412.1.6 Snow loads. Structures shall comply with this code or International Residential Code snow loads as applicable where snow loads at the new location are higher than those at the previous location.

Exception: Structural elements whose stress is not increased by more than 5 percent.

3412.1.7 Flood hazard areas. If relocated or moved into a flood hazard area, structures shall comply with Section 1612.

3412.1.8 Required inspection and repairs. The code official shall be authorized to inspect, or to require approved professionals to inspect at the expense of the owner, the various structural parts of a relocated building to verify that structural components and connections have not sustained structural damage. Any repairs required by the code official as a result of such inspection shall be made prior to the final approval.

Reasons: The AIA Codes and Standards Committee has become increasingly concerned that the sheer volume of codes have become unwieldy, leaving users of the code (designers and code officials) in the precarious position of not being able to embrace all the criteria that a single jurisdiction may choose to enforce. One of the obvious ways that the codes can be streamlined is to eliminate duplicative elements of the codes. The IBC now includes Chapter 34 for existing buildings and the IEBC is dedicated completely too existing buildings. While there is a great deal of duplication in these documents, they are not 100% the same.

Complicating the problem are jurisdictions that adopt both the IBC and the IEBC and do not provide any additional direction as to how the two documents are to be used. Lack of consistency is created among jurisdictions when one neighboring jurisdictions adopt one of the codes, but their neighbor adopts another. If the ICC intends to have provisions that are equally applicable, they can most easily be incorporated into the building code and applied consistently as part of that code.

(202 items) All these definitions are found in the IEBC but are not found in the IBC even though buildings that are designed and constructed per the IBC are subject to the IEBC once completed. Common terminology and meaning should be applied through both codes.

(3401.1.2) The intent in the IEBC Section 101.3 is not the same as the intent of the IBC and should be restated here.

(3401.3) The requirements in Section 104.10.1 in the IEBC are more comprehensively applied to repair and alterations and are moved here for consistency.

(3401.5) Requirements for flood hazard areas appear in three sections (3403.2, 3404.2 and 3405.2) in Chapter 34 establishing the exact same provisions for flood hazard but applying them to additions, alterations and repairs. The IEBC has a completely different approach to the same subject in Section 104.10.1. They are all placed in one section here to provide a concise and consistent set of requirements for flood protection in existing buildings.

(3401.6) By moving the provisions from the IEBC into the IBC this isn't necessary.

(3401.6 (NEW)) Structural requirements in the IBC and IEBC are being made the same.

(3401.7.1 (NEW)) The provisions in Chapter 34 and the IEBC for accessibility use of fire escapes and replacement glass have been moved to the general section of the Chapter so that these requirements will apply to all buildings using any compliance method.

(3403.1 #1) The requirements for alterations in 3404 and Section 403 establish that the alterations must be made in compliance with the IBC and do not make the existing portions of the building any less compliant. The structural requirements are redundant with other structural requirements and are consolidated into Section 3401.4.5 and flood criteria are in Section 3401.5.

(3403.1 #2) In the IBC, Section 3403.1 requires the addition and any alterations needed to make the existing structure "no less conforming." This section also requires the addition to meet the code making any elements that are part of the code for new construction applicable; the accessibility and energy conservation requirements in the IEBC are redundant.

(3403.2) This section is moved to 3401.5 and combined with criteria from the IEBC and other sections in Chapter 34 to form a single section on flood provisions. Both the addition and the existing building are limited to compliance with Chapter 5, so the provisions for height and area in the IEBC Section 1102, are unnecessary; the structural requirements for the additions are addressed in the new Section 3401.4.5.3, and are combined with the requirements from the IEBC. Energy conservation requirements aren't needed since Section

(3404 through 3412) Proposed change to the IBC incorporating the provisions of the IEBC.

Cost Impact: None.

G205-12

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART V – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VI – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VII – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VIII – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IX – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART X – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART XI – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART XII – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.1 (NEW)-G-COLLINS

G206 – 12
3401.2.1 (NEW)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering, (al.godwin@aon.com)

Add new text as follows:

3401.2.1 Yards. Where yards are provided for compliance with any provision of this code or other referenced codes, as necessary to achieve the purpose of such codes, such yards shall be maintained clear and unobstructed in accordance with their original approval, unless permitted to be removed or reduced by this code.

Reason: Yards are a recognized part of the codes for various provisions. As such, they need to be recognized and the code official needs the authority to mandate their maintenance to insure their purpose and intent is assured.

Cost Impact: This code change proposal will not increase the cost of construction.

G206-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3401.2.1 (NEW)-G-GODWIN.doc

G207 – 12
3401.4.1, 3401.4.2 (IEBC [B] 401.2.1, 401.2.2)

Proponent: Vickie J. Lovell, InterCode Incorporated, representing International Window Film Association (vickie@InterCodeinc.com)

Revise as follows:

3401.4 (IEBC [B] 401.2) Building materials and systems. Building materials and systems shall comply with the requirements of this section.

3401.4.1 (IEBC [B] 401.2.1) Existing materials. Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the *building official* to be unsafe per Section 116. <u>This chapter shall not be used require the removal, alteration or abandonment of, nor prevent the continued use and maintenance of an existing building or building system lawfully in existence at the time of adoption of this code.</u>

3401.4.2 (IEBC [B] 401.2.2) New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations, provided no hazard to life, health or property is created<u>, and energy use is not increased</u>. Hazardous materials shall not be used where the code for new construction would not *permit* their use in buildings of similar occupancy, purpose and location.

Reason: Section 3401.3 “Compliance” in the IBC, directs the code user to go to International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code, International Residential Code and NFPA 70 for information on alterations, repairs, additions and changes of occupancy to, or relocation of, existing buildings. The problem is that sections on how to handle existing materials and building systems don’t exist in those codes.

The IBC Chapter 34 on existing buildings is also slightly deficient on how and when new and existing systems and materials are required to be replaced, and when it is necessary to do so.

In particular, the recent interest in energy conservation, the adoption of more aggressive energy policies, and the implementation of more stringent energy and green codes does not give license to require more energy savings in existing buildings than is practical.

This proposal adds excerpted generalized text from IECC C101.4 (it not intended to only apply to energy issues) that limits the application of the requirements for new materials and systems in existing buildings when building systems and materials are to be repaired, replaced, maintained or altered.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

G207-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3401.4.1-G-LOVELL.doc

G208–12
3401.7(NEW) [IEBC [B] 401.4 (NEW)]

Proponent: Vickie Lovell, InterCode Incorporated representing self

Add new text as follows:

3401.7 (IEBC [B] 401.4) Energy Conservation. Level 1 Alterations, as scoped by Section 503.1 of the *International Existing Building Code*, to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the *International Energy Conservation Code* or the *International Residential Code*. The alterations shall conform to the energy requirements of the *International Energy Conservation Code* or the *International Residential Code* only as they relate to new construction.

Exception: The following need not comply provided the energy use of the building in not increased.

1. Storm windows installed over existing fenestration.
2. Glass only replacements in an existing sash and frame.
3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. Reroofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided, however, that an existing vestibule that separates a conditioned space from the exterior shall not be removed,
7. Alterations that replace less than 50 percent of the luminares in a space, provided that such alterations do not increase the installed interior lighting power.
8. Alterations that replace only the bulb and ballast within the existing luminares in a space provided that the *alteration* does not increase the installed interior lighting power.

Reason: The IECC Section C401.2.1 requires compliance with Sections C402, C403, and C405 for existing buildings that are undergoing alternations and repairs. This proposal clarifies that certain features of the existing building undergoing Level 1 alterations are exempt from the requirements of the IECC.

The scoping section is extracted from Section 707 of the IEBC.

This list of exempted items has been extracted from IECC Section C101.4.

A similar proposal will be submitted to the IEBC in the group B proposal cycle.

Without this list of exceptions, the code would require improvements or replacements to be with new materials and systems as for new construction.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

G208-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3401.7#2-G-LOVELL.doc

G209 – 12

3401.7(NEW) [IEBC [B] 401.4 (NEW)]

Proponent: Vickie Lovell, InterCode Incorporated, representing the International Window Film Association

Add new text as follows:

3401.7 (IEBC [B] 401.4) Energy Conservation. Level 1 Alterations, as scoped by Section 503.1 of the *International Existing Building Code*, to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the *International Energy Conservation Code* or the *International Residential Code*. The alterations shall conform to the energy requirements of the *International Energy Conservation Code* or the *International Residential Code* only as they relate to new construction.

Exception: The following need not comply provided the energy use of the building in not increased.

1. Storm windows installed over existing fenestration.
2. Glass only replacements in an existing sash and frame.
3. Surface applied window film on existing single pane fenestration assemblies.
4. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
5. Construction where the existing roof, wall or floor cavity is not exposed.
6. Reroofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
7. Replacement of existing doors that separate *conditioned space* from the exterior shall not require the installation of a vestibule or revolving door, provided, however, that an existing vestibule that separates a *conditioned space* from the exterior shall not be removed,
8. Alterations that replace less than 50 percent of the luminares in a space, provided that such alterations do not increase the installed interior lighting power.
9. Alterations that replace only the bulb and ballast within the existing luminares in a space provided that the *alteration* does not increase the installed interior lighting power.

Reason: The IECC Section C401.2.1 requires compliance with Sections C402, C403, and C405 for existing buildings that are undergoing alternations and repairs. This proposal clarifies that certain features of the existing building undergoing Level 1 alterations are exempt from the requirements of the IECC.

The scoping section is extracted from Section 707 of the IEBC.

This list of exempted items has been extracted from IECC Section C101.4.

Surface applied window film to existing fenestration has been added to the list because it can enhance the performance of existing single pane fenestration products for protection from injuries and property damage due to broken glass, reduces solar heat gain and energy use, ultraviolet transmittance and glare, and improves performance when impacted.

A similar proposal will be submitted to the IEBC in the group B proposal cycle.

Without this list of exceptions, the code would require improvements or replacements to be with new materials and systems as for new construction.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

G209-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3401.7#1-G-LOVELL.doc

G210 – 12
3403.1, 3404.1, 3408.1 (IEBC [B] 402.1, 403.1, 407.1)

Proponent: Charles S. Bajnai, Chesterfield County, VA., ICC Building Code Action Committee (BCAC)

Revise as follows:

3403.1 (IEBC [B] 402.1) General. *Additions* to any building or structure shall comply with the requirements of ~~this code~~ the *International Building Code* for new construction. Where an addition impacts the existing building or structure, a*lterations* to the existing building or structure shall be made to ensure that the affected portion of the existing building or structure ~~together with the *addition* are no less conforming with the provisions of this code than the existing building or structure was prior to the *addition*.~~ complies with the International Codes as adopted for new construction. An existing building together with its *additions* shall comply with the height and area provisions of Chapter 5 of the *International Building Code*.

3404.1 (IEBC [B] 403.1) General. Except as provided by Section 3401.4 or this section, *alterations* to any building or structure shall comply with the requirements of the *International Building* Code for new construction. ~~*Alterations* shall be such that the existing building or structure is no less complying with the provisions of this code than the existing building or structure was prior to the *alteration*.~~ All new construction elements, components, systems, and spaces shall comply with the requirements of the *International Building Code*. An alteration shall not create any nonconformity in the existing building to which the alteration is being made with regard to accessibility, structural strength, fire safety, means of egress, or the capacity of mechanical, plumbing, or electrical systems.

Exceptions:

1. An existing *stairway* shall not be required to comply with the requirements of Section 1009 where the existing space and construction does not allow a reduction in pitch or slope.
2. *Handrails* otherwise required to comply with Section 1009.15 shall not be required to comply with the requirements of Section 1012.6 regarding full extension of the *handrails* where such extensions would be hazardous due to plan configuration.

3408.1 (IEBC [B] 407.1) Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancies or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancies. Subject to the approval of the *building official*, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use ~~is less hazardous, based on life and fire risk, than the existing use.~~ does not create any nonconformity in the existing building to which the alteration is being made with regard to accessibility, structural strength, fire safety, means of egress, or the capacity of mechanical, plumbing, or electrical systems.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx

1. This language provides much needed clarification in the application of the code for the Building Official. The language that the addition and the existing building together must be no less conforming than the existing building was prior to the addition is confusing.

For Example: A new 2000 gross square foot A2 building of Type VB construction, containing 1475 net square foot of Assembly seating space could be constructed with an occupant load of 99 in full compliance with the IBC with no sprinkler or fire alarm system. An addition could then be constructed using Section 402.1 of the IEBC to add an additional 1475 square foot of Assembly seating space adding an additional 99 persons to the occupant load. Reading Section 402.1 a sprinkler or fire alarm system would

NOT be required because the “existing building with the addition are no less conforming than the existing building was prior to the addition”. The existing building did not require either system.

2. This language provides much needed clarification in the application of the code for the Building Official. The language that the alteration shall be such that the existing building is no less conforming than it was prior to the addition is confusing.

3. This language provides clarification in the application of the code for the Building Official. The language that the use is “less hazardous, based on life and fire risk, than the existing use” is confusing and can be misinterpreted. There is no guidance for the building official for less hazardous life risk or fire risk.

Cost Impact: The code change proposal will not increase the cost of construction.

G210-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3403.1-G-BAJNAI-BCAC.doc

G211 – 12
3403.4, 3404.4, 3405.2.1, 3405.2.3, 3408.4 (IEBC [B] 402.4, 403.4, 404.2.1, 404.2.3, 407.4), Chapter 35

Proponent: Jennifer Goupil, The Structural Engineering Institute of ASCE (jgoupil@asce.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3403.4 (IEBC [B] 402.4) Existing structural elements carrying lateral load. Where the *addition* is structurally independent of the *existing structure*, existing lateral load-carrying structural elements shall be permitted to remain unaltered. Where the *addition* is not structurally independent of the *existing structure*, the *existing structure* and its *addition* acting together as a single structure shall be shown to meet the requirements of Sections 1609 and 1613.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is no more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.
2. In lieu of compliance with Section 1613 for the existing structure, it shall be permitted to demonstrate compliance of the existing structure and addition, acting together as a single structure, with the performance objectives in ASCE 41 Section 2.2.4. Alterations to existing structural elements initiated for the purpose of improving the performance of the seismic force-resisting system of the existing structure shall be permitted to be included in the ASCE 41 analysis.

3404.4 (IEBC [B] 403.4) Existing structural elements carrying lateral load. Except as permitted by Section 3404.5, where the *alteration* increases design lateral loads in accordance with Section 1609 or 1613, or where the *alteration* results in a structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the requirements of Sections 1609 and 1613.

Exceptions:

1. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is no more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.
2. In lieu of compliance with Section 1613 for the altered structure, it shall be permitted to demonstrate compliance of the altered structure and addition with the performance objectives in ASCE 41 Section 2.2.4.

3405.2.1 (IEBC [B] 404.2.1) Evaluation. The building shall be evaluated by a *registered design professional*, and the evaluation findings shall be submitted to the building official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads.

Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be 75 percent of those prescribed in Section 1613.

> **Exception:** In lieu of Section 1613, it shall be permitted to demonstrate compliance with the performance objectives in ASCE 41 Section 2.2.1.

3405.2.3 (IEBC [B] 404.2.3) Extent of repair for noncompliant buildings. If the evaluation does not establish compliance of the pre-damage building in accordance with Section 3405.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations that include wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by this code. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than 75 percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

> **Exception:** It shall be permitted to demonstrate compliance of the rehabilitated structure with the performance objectives in ASCE 41 Section 2.2.1.

3408.4 (IEBC [B] 407.4) Seismic. When a change of occupancy results in a structure being reclassified to a higher risk category, the structure shall conform to the seismic requirements for a new structure of the higher risk category.

Exceptions:

1. ~~Specific seismic detailing requirements of Section 1613 for a new structure shall not be required to be met where the seismic performance is shown to be equivalent to that of a new structure. A demonstration of equivalence shall consider the regularity, over strength, redundancy and ductility of the structure.~~ In lieu of Section 1613, it shall be permitted to demonstrate compliance with the performance objectives in ASCE 41 Section 2.2.4.
2. When a change of use results in a structure being reclassified from Risk Category I or II to Risk Category III and the structure is located where the seismic coefficient, *SDS,* is less than 0.33, compliance with the seismic requirements of Section 1613 are not required.

Reason: The purpose of this proposal is to permit the use of ASCE 41-13 as an exception to IBC Chapter 16 and ASCE 7 where seismic evaluation or retrofit is required for existing buildings. ASCE 41-13 is a combination of two standards referenced in the 2012 IEBC (ASCE 31-03 and 41-06) for seismic evaluation and retrofit. In many cases the provisions of ASCE 31 and 41 are more appropriate for existing buildings by providing strength, stiffness, and acceptance criteria for structural systems that can meet the seismic performance objectives of the IBC without necessarily meeting all the specific detailing requirements. These standards have a history of use and as a result of the current (ANSI compliant) update cycle, incorporate recent research to represent the state of practice for seismic evaluation and retrofit.

Some specific reasons in support of the direct reference of ASCE 41 in the IBC are as follows:

- ASCE 31 and 41 already have been allowed as an option in the 2012 IBC by means of the Section 3401.5 reference to the IEBC as “deemed to comply.” The 2012 IEBC utilizes ASCE 31 and 41 as reference standards in a very similar manner to what is being proposed for IBC Chapter 34. This proposal makes the connection more direct and allows the use of ASCE 41 for seismic evaluation and retrofit without requiring compliance with other portions of the IEBC (fire, life safety, MEP, etc), thus giving design professionals more flexibility in using ASCE 41.
- ASCE 41-13 has two explicit performance objectives consistent with the intent of IBC Chapter 34. There is a “new building standard equivalent” (ASCE 41-13 Section 2.2.4) intended to be used in conditions where the IBC/ASCE 7 is referenced. This performance objective utilizes the seismic hazard levels for new buildings in ASCE 7 and includes other requirements and acceptance criteria intended to provide IBC-equivalent performance. There is also a basic existing building performance (ASCE 41-13 Section 2.2.1) that matches the traditional performance objective of ASCE 31 and 41, and consistent with 75% of IBC-level seismic forces. These two performance objectives are proposed to be applied in the appropriate sections of IBC Chapter 34, consistent with how those sections currently specify IBC forces.

- There is a history of ASCE 41 being referenced in some jurisdictions' adoption of the IBC, including Chapter 34 of the 2007 California Building Code.

A public ballot version of the new standard will be available from ASCE in the spring of 2012 and it is expected that it a prepublication (white cover) version will be available prior to the ICC Final Action Hearings in October of 2012. Any person interested in obtaining a public comment copy of ASCE 41-13 may do so by contacting the proponent at jgoupil@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Staff Analysis: This code change proposal references ASCE standard 41, which is already referenced in the _International Existing Building code. However, the proposed change to code text is written to correlate with a new edition of the standard ASCE 41-13, rather than the edition presently referenced in the code, which is the 06 edition. The 2013 edition of this standard is not yet completed, published and available. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved by the Administrative Code Committee, the code text will revert to the text as it appears in the 2012 Edition of the Code. Additionally, if the standard update is approved but the document is not published and available by Dec. 1, 2014, an errata will be issued to the Code that will return the affected code text to the text as it appears in the 2012 Edition of the Code.

G211-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3403.4-G-GOUPIL.doc

G212 – 12

3404.1, 3405.1, 3405.2.3, 3405.5, 3408.4, 3409.1; (IEBC [B] 403.1, 404.1, 404.2.3, 404.5, 407.4, 408.1)

Proponent: David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3404.1 (IEBC [B] 403.1) General. Except as provided by Section 3401.4 or this section, *alterations* to any building or structure shall comply with the requirements of ~~the~~ <u>this</u> code for new construction. *Alterations* shall be such that the existing building or structure is no less ~~complying~~ <u>conforming</u> with the provisions of this code than the existing building or structure was prior to the *alteration*.

Exceptions:

1. An existing *stairway* shall not be required to comply with the requirements of Section 1009 where the existing space and construction does not allow a reduction in pitch or slope.
2. *Handrails* otherwise required to comply with Section 1009.15 shall not be required to comply with the requirements of Section 1012.6 regarding full extension of the *handrails* where such extensions would be hazardous due to plan configuration.

3405.1 (IEBC [B] 404.1) General. Buildings and structures, and parts thereof, shall be repaired in compliance with Section ~~3405 and~~ 3401.2. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section 3401.2, ordinary repairs exempt from *permit* in accordance with Section 105.2, and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

3405.2.3 (IEBC [B] 404.2.3) Extent of repair for noncompliant buildings. If the evaluation does not establish compliance of the predamage building in accordance with Section ~~3404.2.1~~ <u>3405.2.1</u>, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations that include wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by this code. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3405.5 (IEBC [B] 4 04.5) Flood hazard areas. For buildings and structures in *flood hazard areas* established in Section 1612.3, any *repair* that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in *flood hazard areas* established in Section 1612.3, any *repairs* that do not constitute substantial improvement ~~or repair of substantial damage~~ of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

3408.4 (IEBC [B] 407.4) Seismic. When a change of occupancy results in a structure being reclassified to a higher risk category, the structure shall conform to the seismic requirements for a new structure of the higher risk category.

Exceptions:

1. Specific seismic detailing requirements of Section 1613 for a new structure shall not be required to be met where the seismic performance is shown to be equivalent to that of a new structure. A demonstration of equivalence shall consider the regularity, over strength, redundancy and ductility of the structure.
2. When a change of use results in a structure being reclassified from Risk Category I or II to Risk Category III and the structure is located where the seismic coefficient, *SDS,* is less than 0.33, compliance with the seismic requirements of Section 1613 ~~are~~ is not required.

3409.1 (IEBC [B] 408.1) Historic buildings. The provisions of this code relating to the construction, *repair*, *alteration*, *addition*, restoration and ~~movement~~ moving of structures, and change of occupancy shall not be mandatory for *historic buildings* where such buildings are judged by the *building official* to not constitute a distinct life safety hazard.

Reason: This proposal is entirely editorial. At ICC discretion, some of the proposed edits should preferably be addressed as errata. Explanations for proposed edits:

- 3404.1: Match similar wording in 3403.1.
- 3405.1: No need for self-reference. The purpose of this item is to point to 3401.2 re coordination of repairs with maintenance.
- 3405.2.3: Errata
- 3405.5: Edit second paragraph to match first paragraph. Because of the definitions of substantial repair and substantial improvement, this proposed change has no substantive effect and is editorial only.

Cost Impact: The proposed changes will not increase the cost of construction.

G212-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.1-G-BONOWITZ.doc

G213 – 12
PART I – IBC STRUCTURAL
202, 3404.3 through 3404.3.3 (NEW) (IEBC [B] 403.3 through 403.3.3(NEW))
PART II – IEBC
202, 907.2 (NEW), 907.2.1 (NEW), 907.2.2 (NEW)

Proponent: David Bonowitz, S.E., representing self (dbonowitz@att.net)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

PART I – IBC STRUCTURAL

Add new text as follows:

3404.3 (IEBC [B] 403.3) Priority buildings. Priority buildings undergoing alteration shall comply with this section.

3404.3.1 (IEBC [B] 403.3.1) Designation. Unless specifically designated in this section, no building is considered a priority building.

3404.3.2 (IEBC [B] 403.3.2) Triggering alteration. Where the portion of a priority building undergoing the intended alteration exceeds 50 percent of the aggregate area of the building, the alteration work shall include retrofit measures as needed to satisfy Section 3404.3.3. Calculation of the portion undergoing alteration shall include all reconfigured spaces as indicated on the construction documents and, at the discretion of the code official, all spaces served by extended or renovated building systems. The portion undergoing alteration shall be permitted to exclude other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is required by this code.

3404.3.3 (IEBC [B] 403.3.3) Triggered seismic scope and criteria. The seismic force-resisting system of the altered building shall comply with the earthquake design provisions of this code. For purposes of this section, the earthquake loads need not be taken larger than 75 percent of the loads that would be required for the design of a new building of similar structure, purpose, and location.

Add new definition as follows:

PRIORITY BUILDING. A building designated by Section 3404.3.1 for special consideration during alteration projects, based on its risk category, seismic design category, occupancy, size, structural system(s), location, and/or other readily known attributes.

PART II – IEBC

Add new definition as follows:

202
DEFINITIONS

PRIORITY BUILDING. A building designated by Section 907.2.1 for special consideration during alteration projects, based on its risk category, seismic design category, occupancy, size, structural system(s), location, and/or other readily known attributes.

Add new text as follows:

907.2 Priority buildings. Priority buildings undergoing Level 3 alterations shall comply with this section.

907.2.1 Designation. Unless specifically designated in this section, no building is considered a priority building.

907.2.2 Triggered seismic scope and criteria. The seismic force-resisting system of the altered building shall comply with reduced IBC level seismic forces.

Reason: This proposal offers a uniform means to encourage local seismic mitigation efforts through code-based triggers.

Clearly, the success of the I-codes as national model codes has improved the practice of building regulation. Paradoxically, however, the same success may have weakened the ability of jurisdictions to tailor the building code to local needs. The more reliable the model codes become, the more state adoption boards are implementing “no amendment” policies. If it’s good enough for the national model, the thinking goes, it’s good enough for us. This is a convenient policy, and perhaps cost-effective in the short term, but it is flawed, as no solution can be right all the time for the full diversity of the country’s buildings, communities, and natural hazards. At the same time, if a new idea is only applicable to a few markets or local conditions, it has a hard time getting into the national code. Thus the need for local amendments remains, while the ability to enact them diminishes.

What’s needed is a mechanism within the model code to facilitate local amendments in response to a jurisdiction’s particular building stock and performance goals. This proposal offers such a mechanism for triggering seismic retrofits of “priority buildings” when major alterations are made. (Similar provisions could be developed for other load types and project triggers, but this initial proposal has a limited scope by design.)

Currently, alteration projects call for seismic considerations only when they impact the seismic force-resisting system (Sections 807.5 and 907.4) or involve the most dangerous structure types (Sections 706.3, 907.4.4, and 907.4.5). Even then, because the basic alteration provision is based on the *change* of demand-capacity ratios, not their absolute values, highly deficient structures are often allowed to remain unimproved while major architectural or building services improvements are implemented. The apparently easy fix to this problem is simply to trigger seismic retrofit when a high DCR is found. But such an approach is naïve and ineffective, and the current provisions were clarified in recent cycles precisely to avoid this misapplication. Since a standard seismic evaluation will find some seismic deficiency in almost any existing building more than, say, twenty years old, such a trigger would discourage basic modernization projects. More important, such a generic trigger applicable to all building and structure types would not result in predictable mitigation. No public policy objective is served by such a scattershot approach.

Instead, this proposal would allow a jurisdiction to target certain buildings for alteration-triggered retrofits. Not only does this limit the cost to building owners as a group, it focuses the mitigation where it will best serve the community. This is especially important for evolving policies that promote earthquake resilience – the ability of a community to recover from a damaging earthquake. Resilience is not only about avoiding deaths; it is about restoring functions and services in a timely way, maintaining community stability. From this perspective, building regulation is not merely about safety. Regulatory policy will also need to prioritize certain occupancies and certain subsets of the building stock that are most likely to delay recovery. This proposal makes that possible within the context of the building code, which, after all, is a building department’s principal regulatory tool.

The idea of identifying certain buildings for special consideration is not new. Many of our existing building provisions are based on seismic design category, which prioritizes some combinations of occupancy and hazard level over others. Similarly, the IEBC includes specific mitigation provisions that target unreinforced masonry parapets and concrete or masonry wall structures (Sections 706.3, 907.4.4, and 907.4.5). These buildings are targeted because of their historic performance as life-threatening collapse hazards. For many jurisdictions, mitigating just those risks is enough. Lately, however, more jurisdictions are looking beyond mere safety toward resilience. They will use the proposed provisions to target, perhaps, weak story multi-family housing, schools or assembly halls that serve as backup emergency centers, private social service organizations, large non-ductile concrete buildings, buildings in near-fault or liquefiable zones, etc. The priorities can be different – as they should be – for each jurisdiction.

We know that effective mitigation requires the right mix of incentives and legislation. But there is certainly a role for triggered retrofit as well, especially where proactive mandates are unfeasible and voluntary effort is limited. The proposal facilitates the planning and enforcement of triggered retrofits by providing a uniform code-based framework.

The proposed provision would work as follows:

- A jurisdiction would amend proposed Section 907.2.1 to designate its priority buildings. Ideally, this would occur after initial planning studies identify the sectors of the building stock of greatest concern. A jurisdiction that makes no designation loses nothing relative to the provisions of the model code.
- With the buildings designated, any Level 3 Alteration project to a priority building would necessarily invoke at least a seismic evaluation, and possibly a retrofit. The choice of triggering projects is also amendable by a jurisdiction. For example, priority buildings could be slated for retrofit based on certain types of Level 2 or Level 3 alterations or based on metrics other than work area.

Some features of the proposal:

- Priority buildings will be designated based on “readily known attributes.” That is, a potential priority building is identifiable in advance, without the need for a detailed engineering evaluation or analysis. Priority status is also not a function of the proposed alteration project. This means that owners, tenants, lenders, building officials, planners, and others can know in advance what the provision’s effects might be.
- Designation of priority buildings is entirely at the jurisdiction’s option. The default condition is that no buildings are designated at all. In this case, the jurisdiction has in effect the building code it would have had if this provision did not exist.
- As proposed, the provision would apply only reduced seismic loads, consistent with traditional allowances for existing buildings and with similar provisions throughout the IEBC. This, too, is adaptable by a jurisdiction.

- An owner can still avoid a retrofit by modifying the scope of her project to avoid the trigger level. This aspect of triggered retrofit provisions makes them more politically feasible and less disruptive than outright mandates.
- By being part of the building code, the proposed provisions bring with them all the advantages of the I-codes: the consensus of professional communities, administrative provisions, an authority and accountability structure, a full array of technical provisions and reference standards, etc. Otherwise, a special ordinance outside the building code would have to incorporate or specifically cite all these items.

Cost Impact: None.

G213-12
PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.3 (NEW)-G-BONOWITZ.doc

G214 – 12
3404.4.1 (NEW) [IEBC [B] 403.4.1(NEW)]

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3404.4.1 (IEBC [B] 403.4.1) Seismic design category F. Where the portion of the building undergoing the intended alteration exceeds 50 percent of the aggregate area of the building, and where the building is assigned to seismic design category F, the structure of the altered building shall be shown to meet the earthquake design provisions of this code. For purposes of this section, the earthquake loads need not be taken greater than 75 percent of those prescribed in Section 1613 for new buildings of similar occupancy, purpose, and location. New structural members and connections required by this section shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

Reason: This proposal adds a new category of triggered seismic upgrade for the most vulnerable buildings undergoing major alterations. Currently, alteration triggers seismic upgrade only when the intended alteration project has structural impacts (Section 3404.4). A top-to-bottom architectural and mechanical renovation, however, generally triggers no seismic mitigation because such a project rarely increases lateral system DCRs by 10 percent. This proposal fills some of that mitigation gap.

The proposal is measured. It balances regulatory benefits with potential owner costs in three ways (see also the Cost Impact statement below for mitigating factors):

- The proposal covers only essential facilities in areas of the highest seismicity, i.e. those assigned to Seismic Design Category F. These risk category IV buildings are of greatest importance to a community's post-earthquake response and recovery, and if any buildings are deserving of triggered upgrades when their lives are significantly extended through major alterations, these are. Many such buildings (California hospitals, for example) are already addressed by targeted legislation, so will not be affected by the proposed trigger. Yet many jurisdictions with substantial seismic risks do not have histories of proactive mitigation and currently lack the code mechanism to enforce these common-sense improvements to essential facilities. These jurisdictions look to the model codes for best practices.
- The proposal applies only to major alterations where the intended project already involves more than half the building (a Level 3 Alteration, in IEBC terms).
- The proposal incorporates the concept of "reduced" seismic loads familiar to users of the IEBC; reduced loads are also allowed in current Section 3405 for seismic work triggered by repairs.

Cost Impact: Undetermined: Buildings assigned to SDC F that undergo major alteration will be subject to seismic upgrade. However, 1) it is not known how many such buildings exist, 2) many such buildings already have made or would make seismic improvements voluntarily, especially as part of a major alteration, 3) many such buildings would already comply with the reduced forces and would not entail any additional cost, and 4) owners can avoid the triggered work by limiting their scope of alteration.

G214-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.4.1 (NEW)-G-BONOWITZ.doc

G215 – 12
3404.4.5 (NEW) [IEBC [B] 403.4.5 (NEW)]

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3404.4.5 (IEBC [B] 403.4.5) Bracing for unreinforced masonry parapets upon reroofing. Where the intended alteration requires a permit for reroofing and involves removal of roofing materials from more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing to resist out-of-plane seismic forces, unless an evaluation demonstrates compliance of such items. For purposes of this section, design seismic forces need not be taken greater than 75 percent of those that would be required for the design of similar nonstructural components in new buildings of similar purpose and location.

Reason: This proposal introduces a common-sense seismic mitigation provision to the IBC, to match a similar long-standing provision in the IEBC. The proposal is motivated by a pragmatic recognition of best practices from other model codes and ordinances, by observed damage throughout the east coast from the 2011 Virginia earthquake, and by a desire to align key provisions of the IBC and IEBC.

Currently, where the IBC or the IEBC Prescriptive Method is used, jurisdictions lack a mitigation mechanism for this all-too-common and dangerous damage pattern. Unreinforced brick parapets have been killing people in earthquakes since unreinforced brick buildings have existed. Significantly, the people most at risk are not the building owners themselves, but bystanders who happen to be on the sidewalk when the earthquake hits or tenants who attempt to flee the building during the shaking. The most basic mitigation, fulfilling the most basic purpose of existing building regulation, is to require parapet bracing when the life of such a risky building is being extended. Therefore, even if we maintain multiple code approaches for regulating existing buildings, this common-sense and cost-effective mitigation should be a basic provision in all of them.

The proposal is modeled on IEBC Work Area Method, Section 706.3.1, as follows:

- It applies to reroofing projects (a Level 1 Alteration in IEBC terms) because those projects facilitate access to the roof and parapet needed for typical brace installations.
- It only applies to unreinforced masonry parapets. While these exist in relatively few buildings, unbraced URM parapets remain the most widespread, vulnerable, and dangerous structural elements in earthquakes, as we have seen in several recent non-California events, including Virginia, Wells, NV, and Christchurch, NZ.
- It only applies in areas of high seismicity, for buildings assigned to SDC D-F.
- It allows the use of reduced “75 percent” forces. This is consistent with the IEBC provision and with traditional allowances for existing buildings.
- The proposal represents no cost increase at all in jurisdictions (such as Massachusetts, and most of California) that already have similar mitigation triggers of their own or have implemented targeted mitigation ordinances.
- Parapet bracing has a long history and is effective. Los Angeles required URM parapet bracing in 1949.
- Parapet bracing is not intrusive, as it can be done from outside the building.

Cost Impact: URM buildings in areas of high seismicity that undergo reroofing will become subject to parapet bracing. However, there is no additional cost in the many jurisdictions in high seismicity areas that already have similar provisions or targeted mitigation programs.

G215-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.4.5 (NEW) #1-G-BONOWITZ.doc

G216 – 12
3404.4.5 (NEW) [IEBC [B] 403.4.5 (NEW)]

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3404.4.5 (IEBC [B] 403.4.5) Wall anchorage for unreinforced masonry walls in major alterations. Where the portion of the building undergoing the intended alteration exceeds 50 percent of the aggregate area of the building, the building is assigned to seismic design category C, D, E, or F, and the building's structural system includes unreinforced masonry walls, the alteration work shall include installation of wall anchors at the roof line to resist seismic forces, unless an evaluation demonstrates compliance of existing wall anchorage. For purposes of this section, design seismic forces need not be taken greater than 75 percent of those that would be required for the design of new buildings of similar structure, purpose, and location.

Reason: This proposal introduces a common-sense seismic mitigation provision to the IBC, to match a similar long-standing provision in the IEBC. The proposal is motivated by a pragmatic recognition of best practices from other model codes and ordinances, by observed damage throughout the east coast from the 2011 Virginia earthquake, and by a desire to align key provisions of the IBC and IEBC.

Currently, where the IBC or the IEBC Prescriptive Method is used, jurisdictions lack a mitigation mechanism for this vulnerable condition. A lack of roof-to-wall anchors, especially when paired with unbraced URM parapets, poses a remaining risk throughout areas of moderate and high seismicity.

The proposal is modeled on IEBC Work Area Method, Section 907.4.4, as follows:

- It only applies to major alterations where the intended project already involves more than half the building (a Level 3 Alteration, in IEBC terms). Thus, the triggered work represents a small additional cost by comparison, and one that makes sense where significant resources are being spent to modernize a URM building.
- It only applies in areas of moderate to high seismicity. (See note below.)
- It allows the use of reduced "75 percent" forces. This is consistent with the IEBC provision and with traditional allowances for existing buildings.
- The proposal represents no cost increase at all in jurisdictions (such as Massachusetts, and most of California) that already have similar mitigation triggers of their own or have implemented targeted mitigation ordinances.

The proposal would apply in SDC C, D, E, or F. 2012 IEBC Section 907.4.4 applies only in SDC D-F, but motivated by damage from the 2011 Virginia earthquake we are separately proposing extending the IEBC trigger to SDC C. As proponents, we urge consistency between the two codes. If our proposal to extend the IEBC provision to SDC C is disapproved, we would be open to a modification of this IBC proposal that would exempt SDC C.

Cost Impact: URM buildings that undergo a 50% alteration will be subject to wall anchorage. The cost of this work is small compared with the typical cost of such a project. Also, there is no additional cost in the many jurisdictions in higher seismicity areas that already have similar provisions or targeted mitigation programs.

G216-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.4.5 (NEW) #2-G-BONOWITZ.doc

G217 – 12
3404.4.5 (NEW) [IEBC [B] 403.4.5 (NEW)]

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3404.4.5 (IEBC [B] 403.4.5) Bracing for unreinforced masonry parapets in major alterations. Where the portion of the building undergoing the intended alteration exceeds 50 percent of the aggregate area of the building, and where the building is assigned to seismic design category C, D, E, or F, parapets constructed of unreinforced masonry shall have bracing installed as needed to resist out-of-plane seismic forces, unless an evaluation demonstrates compliance of such items. For purposes of this section, design seismic forces need not be taken greater than 75 percent of those that would be required for the design of similar nonstructural components in new buildings of similar purpose and location.

Reason: This proposal introduces a common-sense seismic mitigation provision to the IBC, to match a similar long-standing provision in the IEBC. The proposal is motivated by a pragmatic recognition of best practices from other model codes and ordinances, by observed damage throughout the east coast from the 2011 Virginia earthquake, and by a desire to align key provisions of the IBC and IEBC.

Currently, where the IBC or the IEBC Prescriptive Method is used, jurisdictions lack a mitigation mechanism for this all-too-common and dangerous damage pattern. Unreinforced brick parapets have been killing people in earthquakes since unreinforced brick buildings have existed. Significantly, the people most at risk are not the building owners themselves, but bystanders who happen to be on the sidewalk when the earthquake hits or tenants who attempt to flee the building during the shaking. The most basic mitigation, fulfilling the most basic purpose of existing building regulation, is to require parapet bracing when the life of such a risky building is being extended. Therefore, even if we maintain multiple code approaches for regulating existing buildings, this common-sense and cost-effective mitigation should be a basic provision in all of them.

The proposal is modeled on IEBC Work Area Method, Section 907.4.5, as follows:

- It only applies to major alterations where the intended project already involves more than half the building (a Level 3 Alteration, in IEBC terms). Thus, the triggered parapet bracing represents a small additional cost by comparison, and one that makes sense where significant resources are being spent to modernize a URM building.
- It only applies to unreinforced masonry parapets. While these exist in relatively few buildings, unbraced URM parapets remain the most widespread, vulnerable, and dangerous structural elements in earthquakes, as we have seen in several recent non-California events, including Virginia, Wells, NV, and Christchurch, NZ.
- It only applies in areas of moderate to high seismicity. (See note below.)
- It allows the use of reduced "75 percent" forces. This is consistent with the IEBC provision and with traditional allowances for existing buildings.
- The proposal represents no cost increase at all in jurisdictions (such as Massachusetts, and most of California) that already have similar mitigation triggers of their own or have implemented targeted mitigation ordinances.
- Parapet bracing has a long history and is effective. Los Angeles required URM parapet bracing in 1949.
- Parapet bracing is not intrusive, as it can be done from outside the building.

The proposal would apply in SDC C, D, E, or F. 2012 IEBC Section 907.4.5 applies only in SDC D-F, but motivated by damage from the 2011 Virginia earthquake we are separately proposing extending the IEBC trigger to SDC C. As proponents, we urge consistency between the two codes. If our proposal to extend the IEBC provision to SDC C is disapproved, we would be open to a modification of this IBC proposal that would exempt SDC C.

Cost Impact: Minor: URM buildings that undergo a 50% alteration will become subject to parapet bracing. The cost of parapet bracing is small compared with the typical cost of such a project. Also, there is no additional cost in the many jurisdictions in higher seismicity areas that already have similar provisions or targeted mitigation programs.

G217-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.4.5 (NEW) #3-G-BONOWITZ.doc

G218 – 12
3404.5 (NEW) [IEBC [B] 403.4.5 (NEW)]

Proponent: David Bonowitz, David Bonowitz S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3404.5 (IEBC [B] 403.4.5) Roof diaphragms resisting wind loads in high-wind regions. Where the intended alteration requires a permit for reroofing and involves removal of roofing materials from more than 50 percent of the roof diaphragm of a building or section of a building located where the ultimate design wind speed is greater than 155 mph or in a special wind region as defined in Section 1609, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in Section 1609, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in Section 1609.

Exception: One- and two-family dwellings need not be evaluated or strengthened.

Reason: This proposal introduces a common-sense mitigation provision to the IBC, to match a similar long-standing provision in the IEBC (Section 706.3.2). The proposal is motivated by a pragmatic recognition of best practices from other model codes and ordinances and by a desire to align key provisions of the IBC and IEBC.
Notes on the proposal:

- The 155 mph triggering wind speed is selected so that only buildings in the most critical wind regions along coastlines (as well as the code-designated special wind regions) are triggered. Note that by using a single wind speed value, the provision will now automatically cover different areas for buildings in different risk categories (see IBC Figures 1609A through 1609C).
- Use of 75 percent wind loads for evaluation limits the impact of the provision to the most deficient structures. This is appropriate.
- Houses are exempt. Many jurisdictions already cover houses with the IRC and exempt them entirely from IBC and IEBC provisions. In these cases the proposed exception makes no difference. Where the IBC or IEBC applies, this exception is considered prudent so as not to discourage very common and beneficial reroofing projects.

Cost Impact: Minor: Deficient buildings in high wind areas will be subject to evaluation, but many such buildings will already be adequate for the reduced loads and will incur no retrofit costs. The proposed exception exempts owners for whom the costs are most likely to discourage maintenance and repair.

G218-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.5 (NEW)-G-BONOWITZ.doc

G219 – 12

3404.7, 3404.7.1, 3404.7.2, 3404.7.3 (IEBC [B] 403.7, 403.7.1, 403.7.2, 403.7.3)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Add new text as follows:

3404.7 (IEBC [B] 403.7) Refuge areas. Where alterations affect the configuration of an area utilized as a refuge areas, the capacity of the refuge area shall not be reduced below that required in Section 3404.7.1 through 3404.7.3.

3404.7.1 (IEBC [B] 403.7.1) Smoke compartments. In Group I-2 and I-3 occupancies, the required capacity of the refuge areas for smoke compartments in accordance with Section 407.5.1 and 408.6 .2 shall be maintained.

3404.7.2 (IEBC [B] 403.7.2) Ambulatory care. In ambulatory care facilities required to be separated by Section 422.2, the required capacity of the refuge areas for smoke compartments in accordance with Section 422.4 shall be maintained.

3404.7.3 (IEBC [B] 403.7.3) Horizontal exits. The required capacity of the refuge area for horizontal exits in accordance with Section 1025.4 shall be maintained.

Reason: When a space is being altered the designer needs to check that an alteration does not conflict with the area being used as a refuge area from an adjacent compartment. There is a correlative change being proposed for IEBC Chapter 8.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

Cost Impact: None

G219-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3404.7-G-WILLIAMS-ADHOC.doc

G220 – 12
3405.1.1 (NEW) [IEBC [B] 404.1.1 (NEW)]

Proponent: Dan Casella, Chair, ICC 300 Development Committee, Standard for Bleachers, Folding and Telescopic Seating and Grandstands

Add new text as follows:

3405.1.1 (IEBC [B] 404.1.1) Bleacher systems. Existing bleachers, folding and telescopic seating and grandstands being repaired shall comply with ICC 300.

Reason: Directs the code user to the applicable ICC 300 Chapter 5 that specifically deals with gap, guard, repair and maintenance requirements of existing bleachers, folding and telescopic seating and grandstands. Provisions include inspections, maintenance and repairs, guard and openings between the floor boards and the seats. There will be a correlative change to IEBC Section 601.4.

The purpose of the ICC 300 standard is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, and safety to life and property relative to the construction, alteration, repair, operation, and maintenance of new and existing temporary and permanent bench bleachers, folding and telescopic seating, and grandstands. Information can be downloaded from the following website: http://www.iccsafe.org/cs/standards/IS-BLE/Pages/default.aspx.

Cost Impact: The proposed changes will not increase the cost of construction.

G220-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3405.1.1 (NEW)-G-CASELLA-ADHOC.doc

G221 – 12
PART I – INTERNATIONAL BUILDING CODE
3405.2 (IEBC [B] 404.2)
PART II – INTERNATIONAL EXISTING BUILDING CODE
IEBC [B] 606.2.2

Proponent: Paul Bennett, Knott Laboratory, LLC, representing Colorado Chapter of ICC (pbennett@knottlab.com)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

PART I – IBC STRUCTURAL

Revise as follows:

3405.2 (IEBC [B] 404.2) Substantial structural damage to vertical elements of the lateral-force-resisting system. A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3405.2.1 through 3405.2.3.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose *substantial structural damage* was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.
3. <u>Buildings damaged solely by vehicle impact or fire.</u>

PART II – IEBC

IEBC [B] 606.2.2 Substantial structural damage to vertical elements of the lateral force-resisting system. A building that has sustained *substantial structural damage* to the vertical elements of its lateral force-resisting system shall be evaluated in accordance with Section 606.2.2.1, and either repaired in accordance with Section 606.2.2.2 or repaired and rehabilitated in accordance with Section 606.2.2.3, depending on the results of the evaluation.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.
3. <u>Buildings damaged solely by vehicle impact or fire.</u>

Reason: Older structures may be damaged by vehicle impacts or fires, triggering a “substantial structural damage” threshold assessment and subsequent structural evaluation. When substantial structural damage has been caused by wind, snow or seismic forces, it is recognized that structural strengthening of undamaged building elements is warranted and prudent for life safety purposes. When damage has been caused by vehicle impact or fire, it is unreasonable to require the structural evaluation and likely upgrades to undamaged building elements. This effectively penalizes a building owner for unintended damage that was not initiated as the result of an inherently weak or inadequate structure.

Structural evaluations typically reveal that older structures (pre 1940) will require extensive strengthening, to undamaged building elements to satisfy the current code provisions. This is particularly true for older masonry structures.

Often the property owner's insurance will provide law and ordinance coverage (building code upgrade coverage) for a value equal to 10% of the policy limits. In many instances, this coverage amount is insufficiently adequate to cover the required upgrades. Ultimately the building owner must pay for the building upgrades on their own.

This change allows a building damaged solely by fire or a vehicle impact to be repaired in accordance with the current code requirements, but not mandate that undamaged components be evaluated and potentially be upgraded or replaced.

Cost Impact: This will not increase the cost of construction.

G221-12
PART I- IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3405.2-G-BENNETT.doc

G222 – 12
3405.2.2, 3405.4 (IEBC [B] 404.2.2, 404.4)

Proponent: David Bonowitz, David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3405.2.2 (IEBC [B] 404.2.2) Extent of repair for compliant buildings. If the evaluation establishes compliance of the pre-damage building in accordance with Section 3405.2.1, then repairs shall be permitted that restore the building to its pre-damage state, based on material properties and design strengths applicable at the time of ~~original~~ the most recently permitted construction.

3405.4 (IEBC [B] 404.4) Less than substantial structural damage. For damage less than *substantial structural damage*, *repairs* shall be allowed that restore the building to its pre-damage state, based on material properties and design strengths applicable at the time of ~~original~~ the most recently permitted construction. New structural members and connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

Reason: In both provisions, the intent is to refer back to the pre-damage condition. In many cases this is not the “original” condition of the building when it was first erected. The “most recently permitted” condition better conveys the intent.

Cost Impact: The proposed changes will not increase the cost of construction.

G222-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3405.2.2-G-BONOWITZ

G223 – 12
3405.3 (IEBC [B] 404.3)

Proponent: David Bonowitz, David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3405.3 (IEBC [B] 404.3) Substantial structural damage to gravity load-carrying components. Gravity load-carrying components that have sustained *substantial structural damage* shall be rehabilitated to comply with the applicable provisions of this code for dead and live loads. Snow loads shall be considered if the *substantial structural damage* was caused by or related to snow load effects. Existing gravity load-carrying structural elements shall be permitted to be designed for live loads *approved* prior to the damage. <u>If the *approved* live load is less than that required by Section 1607, the area designed for the nonconforming live load shall be posted with placards of *approved* design indicating the *approved* live load.</u> Nondamaged gravity load-carrying components that receive dead, live or snow loads from rehabilitated components shall also be rehabilitated or shown to have the capacity to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

Reason: The proposal adds a useful provision from the Alterations and Additions sections to the Repairs section.

Cost Impact: The proposed changes will not increase the cost of construction.

G223-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3405.3-G-BONOWITZ

G224 – 12
PART I – INTERNATIONAL BUILDING CODE
3405.3.1 (IEBC [B] 404.3.1)
PART II – INTERNATIONAL EXISTING BUILDING CODE
IEBC [B] 606.2.3.1

Proponent: Paul Bennett, Knott Laboratory, LLC, representing Colorado Chapter of ICC (pbennett@knottlab.com)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

PART I- IBC STRUCTURAL

Revise as follows:

3405.3.1 (IEBC [B] 404.3.1) Lateral force-resisting elements. Regardless of the level of damage to vertical elements of the lateral force-resisting system, if *substantial structural damage* to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3405.2.1 and, if noncompliant, rehabilitated in accordance with Section 3405.2.3.

Exceptions:

1. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. Buildings assigned to Seismic Design Category A, B, or C whose *substantial structural damage* was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
3. <u>Buildings damaged solely by vehicle impact or fire.</u>

PART II – IEBC

IEBC [B] 606.2.3.1 Lateral force-resisting elements. Regardless of the level of damage to gravity elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section 606.2.2.1 and, if noncompliant, rehabilitated in accordance with Section 606.2.2.3.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.
3. <u>Buildings damaged solely by vehicle impact or fire.</u>

Reason: Older structures may be damaged by vehicle impacts or fires, triggering a "substantial structural damage" threshold assessment and subsequent structural evaluation. When substantial structural damage has been caused by wind, snow or seismic forces, it is recognized that structural strengthening of undamaged building elements is warranted and prudent for life safety purposes. When damage has been caused by vehicle impact or fire, it is unreasonable to require the structural evaluation and likely upgrades to undamaged building elements. This effectively penalizes a building owner for unintended damage that was not initiated as the result of an inherently weak or inadequate structure.

Structural evaluations typically reveal that older structures (pre 1940) will require extensive strengthening, to undamaged building elements to satisfy the current code provisions. This is particularly true for older masonry structures.

Often the property owner's insurance will provide law and ordinance coverage (building code upgrade coverage) for a value equal to 10% of the policy limits. In many instances, this coverage amount is insufficiently adequate to cover the required upgrades. Ultimately the building owner must pay for the building upgrades on their own.

This change allows a building damaged solely by fire or a vehicle impact to be repaired in accordance with the current code requirements, but not mandate that undamaged components be evaluated and potentially be upgraded or replaced.

Cost Impact: This will not increase the cost of construction.

G224-12
PART I- IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3405.3.1-G-BENNETT.doc

G225 – 12
3407, 3407.1, 3407.2 (NEW) [IEBC [B] 406, 406.1, 406.2 (NEW)]

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

Revise as follows:

SECTION 3407 (IEBC 406)
GLASS REPLACEMENT AND EXISTING WINDOWS

3407.1 (IEBC [B] 406.1) ~~Conformance~~ Replacement glass. The installation or replacement of glass shall be as required for new installations.

3407.2 (IEBC 406.2) Replacement Windows. All windows in Group R-2 or R-3 buildings containing dwelling units, window opening control devices complying with ASTM F2090 shall be installed where an existing window is replaced and where all the following apply to the replacement window:

1. The window is operable;
2. The window replacement includes replacement of the sash and the frame;
3. The top of the sill of the window opening is at a height less than 36 inches (915 mm) above the finished floor;
4. The window will permit openings that will allow passage of a 4-inch diameter (102 mm) sphere when the window is in its largest opened position; and
5. The vertical distance from the top of the sill of the window opening to the finished grade or other surface below, on the exterior of the building, is greater than 72 inches (1829 mm).

The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2.

Exceptions:

1. Operable windows where the top of the sill of the window opening is located more than 75 feet (22.86 m) above the finished grade or other surface below, on the exterior of the room, space or building, and that are provided with window fall prevention devices that comply with ASTM F 2006.
2. Operable windows with openings that are provided with window fall prevention devices that comply with ASTM F2090.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The CTC Study Group on Child Window Safety has been fostering changes to the code over the past few cycles to clarify the application and specify the appropriate standards to be included in the code regarding child window safety. Suring the last cycle changes to incorporate those changes were successful in both the IBC and IRC. One of the areas that had not been the focus of CTC was existing windows in existing windows.

This code change incorporates parallel requirements to Section 1013.8 when an existing window is replaced, including the sash and the frame in an R-2 or R-3 building containing dwelling units. By incorporating this section in Chapter 34 and a companion change to the IEBC we can achieve a higher level of safety for children with minimum cost impact.

Cost Impact: The proposed changes will increase the cost of construction.

G225-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3407-G-BALDASSARRA-CTC.doc

G226 – 12
3407.1 (IEBC [B] 406.1)

Proponent: Vickie J. Lovell, InterCode Incorporated, representing International Window Film Association (vickie@InterCodeinc.com)

Revise as follows:

3407.1 (IEBC [B] 406.1) Conformance. The installation or replacement of glass, sash, and frame shall be as required for new installations.

Reason: This proposal clarifies that the new installation requirement is triggered by the replacement of the entire fenestration assembly, not just the vision glass. Without this change, this section conflicts in theory with the IECC Section C101.4.3 Item 2. That section is clear that the glass by itself may be replaced without compliance with the energy code. This proposal brings this clarification to the IBC.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

G226-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3407.1-G-LOVELL.doc

G227 – 12
3408 (NEW) (IEBC [B] 407 (NEW))

Proponent: Jeff Inks, Window and Door Manufacturers Association (jinks@wdma.com)

Add new text as follows:

SECTION 3408 (IEBC 407)
REPLACEMENT WINDOW OPENINGS

3408.1 (IEBC [B] 407.1) Replacement window openings. Where windows are required to provide *emergency escape and rescue openings* in Group R-2 and R-3 occupancies, replacement windows shall be exempt from the requirements of Sections 1029.2, 1029.3 and 1029.5 provided the replacement window meets the following conditions:

1. The replacement window is the manufacturer's largest standard size window that will fit within the existing frame or existing rough opening. The replacement window shall be permitted to be of the same operating style as the existing window or a style that provides for an equal or greater window opening area than the existing window.
2. The replacement of the window is not part of a change of occupancy.

Reason: The intent of this proposal is to ensure that the IBC does not discourage or prevent improvements in fire safety in older residential occupancies by requiring replacement windows meet all of the provisions of Section 1029 when doing so would require increasing the size of the rough opening or altering the interior wall. Because many of these older buildings were constructed under codes that did not include the same emergency escape and rescue opening provisions that the IBC now requires for new construction, the only way to fully meet all of the requirements of Section 1029 for new construction if required when windows are replaced is to enlarge the rough opening and/or make significant alterations to the interior wall in order to accommodate any increase in window size or lowering of a sill.

At the very least, the significant cost and design challenges of altering the rough opening or interior wall can discourage window replacement and at worst can prevent the replacement of older windows that are harder to operate or inoperable all together because of their age and, that are significantly less energy efficient. When that happens, safety in compromised.

On the whole, while older bedroom windows in older buildings may not provide the full clear opening that is required for new construction or may have a sill height above 44 inches, they nonetheless still provide a viable emergency and escape rescue opening which is the primary intent of the code. Replacement of these windows with the same type of operating window or other type that can provide an equal or greater clear opening than the existing window -- even if they do not fully meet the clear opening or sill height requirements of Section 1029 – is always an improvement in safety, especially when a replacement opening can provide a larger clear opening than the existing window. Such improvements in safety should not be discouraged or prevented by overly onerous requirements for replacement windows.

This proposal is intended to ensure that doesn't happen by providing limited exceptions to the requirements of Section 1029 that can only be applied when certain conditions are met. The requirements that emergency escape and rescue openings be provided and the operational requirements for windows providing them are maintained for replacement windows as for new construction.

Cost Impact: This proposal will not increase the cost of construction

G227-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3408 (NEW)-G-INKS.doc

G228 – 12
3408.1 (IEBC [B] 407.1)

Proponent: David Bonowitz, David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3408.1 (IEBC [B] 407.1) Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancies or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancies. Subject to the approval of the *building official*, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

> <u>**Exception:** The building need not be made to comply with the seismic requirements for a new structure unless required by Section 3408.4.</u>

Reason: This proposal clarifies the intent of the code and resolves an apparent, though misunderstood, conflict regarding the seismic upgrade trigger for a Change of Occupancy project. Currently, section 3408.1 calls for full compliance with the code for new construction in the event of any change of occupancy or use. In concept, this would include compliance with earthquake design provisions. Section 3408.4, however, calls for seismic upgrade only when the project would also change the Risk Category. This proposal clarifies the intent and removes the conflict by adding an Exception to Section 3408.4. The wording of the exception is borrowed from current sections 3408.1 and 3408.4.

Note to ICC: A similar change is appropriate for IEBC Section 407. As in past cycles, we expect this to be made as an automatic coordination change, so we have not submitted a corresponding proposal to the IEBC.

Cost Impact: The proposed changes will not increase the cost of construction.

G228-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3408.1-G-BONOWITZ

G229 – 12
3408.1 (IEBC [B] 407.1)

Proponent: Maureen Traxler, City of Seattle Dept. of Planning & Development, representing Washington Association of Building Officials Technical Code Development (maureen.traxler@seattle.gov)

Revise as follows:

3408.1 (IEBC [B] 407.1) Conformance. No change shall be made in the use or occupancy of any building ~~that would place the building in a different division of the same group of occupancies or in a different group of occupancies,~~ or portion thereof unless such building is made to comply with the requirements of this code for ~~such division or group of occupancies.~~ the occupancy. Changes in use or occupancy in a building or portion thereof shall be such that the existing building is no less complying with the provisions of this code than the existing building or structure was prior to the change. Subject to the approval of the *building official*, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use. Change of tenants will be permitted without complying with this Section 3408 so long as the use is not changed.

Reason: This code change updates the charging language for change of occupancy. The term "division of occupancy" is deleted because the term is only used once elsewhere in the Code (Section 111.2), and its meaning is vague. When a building changes to a use that has special Building Code requirements, the building, or the portions of the building where the new use is located, should be made to comply with those code requirements. For example, if an ambulatory care facility expands from treatment of 3 patients to treatment of 6, Section 903.2.2 would require a sprinkler system to be installed. If an S-1 occupancy changes from the storage of clothing to storage of furniture, Section 903.2.9 would require sprinklers. Hazardous materials storage might not be allowed to move to a higher floor. There are many other similar examples. Even though the code official would not always be aware of these changes, this proposal would provide authority to require compliance when changed conditions are known, and prohibits changes in use that reduce a building's compliance.

Cost Impact: The code change proposal will not increase the cost of construction.

G229-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3408.1-G-TRAXLER.doc

G230 – 12
3408.1 (IEBC [B] 407.1)

Proponent: Marc Sampson, Longmont Fire Department, CO Representing Fire Marshal's Association of Colorado

Revise as follows:

3408.1 (IEBC [B] 407.1) ~~Conformance~~ <u>Change of use or occupancy</u>. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancies or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancies.

<u>**3408.1.1 (IEBC [B] 407.1.1) Change to less hazardous use.**</u> Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

<u>**3408.1.2 (IEBC [B] 407.1.2) Change in use from the *International Residential Code*.** For dwellings or townhouses constructed in compliance with the *International Residential Code*, no change shall be made in the use or occupancy of a building which would result in an occupancy regulated by this code unless such building is made to comply with the requirements of this code for the applicable occupancy classification.</u>

REASON: Currently the code contains no provision on how to transition from an IRC structure to an IBC structure. The IBC is based on 'occupancy classifications' while the IRC is not.

These revisions are proposed to the IBC to clarify the application of the code when a building constructed under the IRC undergoes a change of use or occupancy which would now place the building under the regulation of the IBC. Since a dwelling constructed under the IRC is not constructed identically to a dwelling constructed under the IBC, it creates confusion as to how to make this transition.

The 2nd sentence of Section 3408.1 is placed into a separate section creating Section 3408.1.1. This section states the building official can allow a change of occupancy. This section should not be hidden within the text, but in a standalone section.

Correlating code changes have been submitted to the IEBC and IFC. The IEBC and IFC code changes are provided below so you can see that all three codes will be correlated.

The correlating code change to the IFC is as follows:

Revise IFC Section 102.3 as follows:

[A] 102.3 Change of use or occupancy. No change shall be made in the use or occupancy of any structure that would place the structure in a different division of the same group or occupancy or in a different group of occupancies, unless such structure is made to comply with the requirements of this code and the International Building Code.

<u>**[A] 102.3.1 Less hazardous use.**</u> Subject to the approval of the fire code official, the use or occupancy of an existing structure shall be allowed to be changed and the structure is allowed to be occupied for purposes in other groups without conforming to all of the requirements of this code and the International Building Code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

<u>**[A] 102.3.2 Change in use from the *International Residential Code*.** For dwellings or townhouses constructed in compliance with the *International Residential Code*, no change shall be made in the use or occupancy of a building which would result in an occupancy regulated by this code unless such building is made to comply with the requirements of this code for the applicable occupancy classification.</u>

Even though the text in IFC Section 102.3 does not show [B] in the margin, the text is identical. Once the revisions are approved to the IBC, IEBC and IFC, all three codes will contain the equivalent requirements and correlate.

Cost Impact: The code change will not increase the cost of construction.

G230-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3408.1-G-SAMPSON.doc

G231 – 12
202, 3408.1.1 (NEW) [IEBC [B] 202, 407.1.1 (NEW)]

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com)

Add new text as follow:

3408.1.1 (IEBC [B] 407.1.1) Change of Character. A change in occupancy with no change of occupancy classification shall not be made to any structure that will subject the structure to any special provisions of the applicable *International Codes*, without approval of the *building official*. Compliance shall be only as necessary to meet the specific provisions and is not intended to require the entire building be brought into compliance.

Add new definition as follows:

CHANGE OF OCCUPANCY. A change in the purpose or level of activity within a building that involves a change in application of the requirements of this code.

Reason: In the last code cycle, Code Change EB27-09/10 added "10. Ambulatory health care facilities" to IEBC Section 902.1 (now 1002.1) under the classification of "change of character. This section in the IEBC, along with The IEBC definition of Change of Use, in general verbiage, recognizes that there are changes of use that do not involve changing occupancy groups.

IEBC Section 1001.2 states:

> "**1001.2 Change in occupancy with no change in occupancy classification.** A change in occupancy, as defined in Section 202, with no *change of occupancy* classification shall not be made to any structure that will subject the structure to any special provisions of the applicable *International Codes*, including the provisions of Section 1002 through 1011, without the approval of the code official."

This proposal is to bring those provisions from IEBC Section 1001.2 over into Chapter 34 of the IBC.

As noted in the IEBC, it is possible to change a use without changing the occupancy classification. Some examples are as follows:

1. Group A-2 bar with an occupant load of 275 to a Group A-2 bar with an occupant load of 350. Increasing occupant loads is permitted under Section 1004.2.
2. Group B office to Group B Ambulatory Health Care
3. Group B office to Group B café
4. Group F-1 factory to a Group F-1 woodworking shop.
5. Group H-3 Oxidizing gases to Group H-3 Flammable solids
6. Group M retail to Group M retail of upholstered furniture
7. Group S-1 warehouse to Group S-1 tire warehouse over 20,000 cubic feet
8. Group S-1 warehouse to Group S-1 motor vehicle repair garage
9. Group R-2 apartment to Group R-2 Live/Work unit.

Each of these classifications has particular code provisions that would apply if the occupancy had been originally identified. Some items might be fire protection, alarms, fresh air, restroom facilities, accessibility, smoke barriers, etc. The IBC currently does not specifically address these changes since they do not change Groups or change Divisions within Groups.

When making a change of character, it is not necessary to totally re-evaluate the building. Only the new applicable provisions should be addressed.

For example:

Group A-2 bar with an occupant load of 275 to a Group A-2 bar with an occupant load of 350.

Items that might require review:

Means of egress – 1004.2, to the public way
Sprinklers – 903.2.1.2, only in this space
Alarms – 907.2.1, only in this space
Restrooms – Chapter 29
Fresh air – IMC
Accessibility – see Section 3411
If food – upgrade of interceptor provisions of the IPC

Items that might not require a new review:

Height and area
Exterior walls and openings

As this is a confusing issue, the code official will need to define what items of correction are appropriate. While the wording may be new, code officials have performed this service for years. This proposal just puts it in the code.

Cost Impact: This code change proposal will not increase the cost of construction.

G231-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3408.1.1 (NEW)-G-GODWIN

G232 – 12
3409.1, 3409.2 [IEBC [B] 408.1, 408.2 (NEW)]

Proponent: David Bonowitz, David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

Revise as follows:

SECTION 3409 (IEBC [B] 408)
HISTORIC BUILDINGS

3409.1 (IEBC [B] 408.1) ~~Historic buildings~~ General. The provisions of this code that require improvements relative to a building's existing condition or, in the case of repairs, that require improvements relative to a building's pre-damage condition, shall not be mandatory for historic buildings unless specifically required by this Section. ~~relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings where such buildings are judged by the building official to not constitute a distinct life safety hazard.~~

3409.2 (IEBC [B] 408.2) Life safety hazards. The provisions of this code shall apply to historic buildings judged by the building official to constitute a distinct life safety hazard.

~~3409.2~~ 3409.3 (IEBC [B] ~~408.2~~ 408.3) Flood hazard areas. Within flood hazard areas established in accordance with Section 1612.3, where the work proposed constitutes substantial improvement as defined in Section 1612.2, the building shall be brought into compliance with Section 1612.

Exception: Historic buildings that are:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;
2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

Reason: This proposal clarifies what we believe to be the intent of the code with respect to historic buildings: they should be maintained, and new work should be to code standards (with allowances for historic materials already in 3401.4), but upgrades normally triggered in non-historic buildings generally should not be triggered in historic buildings.

The current provision waives all of the code's Existing Buildings provisions for any historic building. We believe this is too broad a waiver, and likely unintended. The better approach, consistent with the more lengthy and detailed IEBC provisions, is to enforce maintenance provisions but to waive triggered upgrades.

Specifically, the proposal maintains the current provisions regarding "distinct life safety hazards" and flood hazard areas" but does the following:

- Editorially changes the title of Section 3409.1 to avoid duplication of title of whole Section 3409.
- Modifies Section 3409.1 to exempt only "improvements" relative to the existing condition before an addition, alteration, repair, change of occupancy, or relocation project begins.
- Moves the current provision regarding "distinct life safety hazards" to its own subsection and rewords it to remove a confusing double negative. Note that in doing so the proposal has the effect of saying that an historic building is *not* a distinct life safety hazard unless it is explicitly judged to be one. This is a change relative to the current provision.
- Renumbers 3409.2 to 3409.3 but otherwise leave the flood provisions untouched.

Note to ICC: A similar change is appropriate for IEBC Section 408. As in past cycles, we expect this to be made as an automatic coordination change, so we have not submitted a corresponding proposal to the IEBC.

Cost Impact: This code change proposal will not increase the cost of construction.

G232-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3409.1-G-BONOWITZ

G233 – 12
3410.2(NEW) [IEBC [B] 409.2 (NEW)]

Proponent: Dan Casella, Chair, ICC 300 Development Committee, Standard for Bleachers, Folding and Telescopic Seating and Grandstands

Revise as follows:

3410.1 (IEBC [B] 409.1) Conformance. Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.

<u>**3410.2 (IEBC [B] 409.2) Bleacher systems.** Bleachers, folding or telescopic seating or grandstands that are being relocated shall comply with ICC 300.</u>

Reason: The purpose is for coordination with ICC 300 Section 505. There is also a correlative change to IEBC Section 1301. Directs code users to the ICC-300 for correct rules on relocation of an existing bleacher (due to floor replacement or gym layout redesign or other conditions) and other related rules on seating that may apply during building repairs or remodeling. Sections 305, 309 and 311 are addressed in Chapter 5. Section 310, Accessibility, is required when the alteration would require movement of major structural elements for the bleacher.

ICC 300 text is indicated below.

SECTION 505
SEATING RELOCATION

Section 505.1 Relocating existing bleachers. Relocating existing bleachers to a new location shall be permitted provided the existing bleacher complies with Sections 303.6, 304, 306, 307, 308 and 310 and Chapter 5.

> **Exception:** Where full compliance with Sections 310.1 and 501.4 is *technically infeasible*, the relocated existing bleachers shall provide access in compliance with the building code to the maximum extent technically feasible.

The purpose of the ICC 300 standard is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, and safety to life and property relative to the construction, alteration, repair, operation, and maintenance of new and existing temporary and permanent bench bleachers, folding and telescopic seating, and grandstands. Information can be downloaded from the following website: http://www.iccsafe.org/cs/standards/IS-BLE/Pages/default.aspx.

Cost Impact: The proposed changes will not increase the cost of construction.

G233-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3410.2 (NEW)-G-CASELLA-ADHOC.doc

G234 – 12

3411.3 (IEBC [B] 410.3)

Proponent: Clare Ray Allshouse AIA, CBO, City of Shoreline, WA, representing Washington Association of Building Officials Technical Code Development Committee (rallshouse@shorelinewa.gov)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.3 (IEBC [B] 410.3) Extent of application. An *alteration* of an existing facility shall not impose a requirement for greater accessibility than that which would be required for new construction. Alterations shall not reduce or have the effect of reducing accessibility of a *facility* or portion of a *facility* <u>to less than that which would be required for new construction</u>.

Reason: The current specific requirement to restrict any reduction of existing accessibility has the unintended consequence of not allowing for a lesser level of accessibility otherwise allowed by current code. This is inconsistent with the code language in the first sentence of this section that prohibits imposing a requirement for greater accessibility than that which be required for new construction. In addition, current ADA and ABA Accessibility Guidelines for Buildings and Facilities Section 202.3.1 Prohibited Reduction in Access, as published in the Federal Register, states: "An alteration that decreases or has the effect of decreasing the accessibility of a building or facility below the requirements for new construction at the time of the alteration is prohibited." To be consistent with this standard, an alteration to an existing fully accessible space should be allowed to have an area that is not accessible provided that such area would not be required to be accessible in new construction.

Cost Impact: The code change proposal will not increase the cost of construction.

G234-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.3-G-ALLSHOUSE

G235 – 12

3411.1, 3411.4, 3411.5.1 (NEW), 3411.6, 3411.8.9 [IEBC [B] 410.1, 410.4, 410.5.1 (NEW), 410.6, 410.8.9]

Proponent: Larry Brown, National Association of Home Builders (NAHB)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.1 (IEBC [B] 410.1) Scope. The provisions of Sections 3411.1 through 3411.9 apply to maintenance, change of occupancy, *additions* and *alterations* to existing buildings, including those identified as *historic buildings*.

> **Exception:** Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities being altered or undergoing a change of occupancy.

3411.4 (IEBC [B] 410.4) Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section.

> ~~**Exception:** Type B dwelling units or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.~~

3411.5.1 (IEBC [B] 410.5.1) Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for Type B units apply only to the quantity of the spaces being added

3411.6 (IEBC [B] 410.6) Alterations. A facility that is altered shall comply with the applicable provisions in Chapter 11 of this code, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3411.7.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall be permitted to meet the provision for a Type B dwelling unit.
4. ~~Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.~~

~~**3411.8.9 (I EBC [B] 410.8.9) Type B dwelling or sleeping units.** Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for Type B units apply only to the quantity of the spaces being added. Where Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered and where the work area is greater than 50 percent of the aggregate area of the building, the requirements of Section 1107 for Type B units apply only to the quantity of the spaces being altered.~~

Reason: This change added to the 2012 IBC far exceeds the Federal Fair Housing Act (FHAct) requirements for accessibility and should be deleted. The I-Codes should be used for the purpose of providing construction requirements to address life-safety concerns, not as a vehicle to orchestrate social change. Of most importance is that these provisions requiring compliance with IBC "Type B Units", is contrary to Federal law. First, these provisions expands the Federal law that only multifamily "buildings" constructed for first occupancy after March 13, 1991 need to be constructed to the FHAct requirements. Second, these provisions apply to ALL existing buildings converted to multifamily use, no matter when they were first constructed. But, Federal law does not require existing buildings undergoing alterations to comply with the FHAct. Another problem is that these provisions seems to be an attempt to circumvent and nullify the FHAct and the rulings handed down by the Federal Courts. The FHAct Rules includes a two-year statute of limitations on bringing suit and making corrections to an existing non-compliant multifamily building, a statute of limitations being upheld by the Federal Circuit Courts of Appeals. There is also the aspect of Federal preemption. By containing these provisions the I-Codes will be contrary to Federal Law. As Federal Law will preempt any state or local law, there will be challenges to the adoption of this Code. There is no benefit for any state or local jurisdiction to have to fight a challenge in court if the adoption of the I-Codes contains these provisions. It appears the inclusion of these provisions in the I-Codes is an attempt by a department of the federal government to mandate social change without going through the Federal Administrative Procedure Act rulemaking process. If it is intended that HUD will be adding this type of provision to the requirements of the FHAct, then this type of provisions should not be included in the I-Codes until such time as they are enacted into Federal law.

Cost Impact: The code change proposal will not increase the cost of construction.

G235-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.4-G-BROWN

G236 – 12
3411.4 [IEBC [B] 410.4], 3411.6 [IEBC [B] 410.6], 3411.8.9 [IEBC [B] 410.8.9]

Proponent: Ron Nickson, National Multi Housing Council (rnickson@nmhc.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.4 (IEBC [B] 410.4) Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section.

> **Exception:** Type B *dwelling units* or *sleeping units* required by Section 1107 of this code are not required to be provided in existing buildings and facilities~~ undergoing a change of occupancy in conjunction with *alterations* where the work area is 50 percent or less of the aggregate area of the building~~.

3411.6 (IEBC [B] 410.6) Alterations. A *facility* that is altered shall comply with the applicable provisions in Chapter 11 of this code, unless *technically infeasible*. Where compliance with this section is *technically infeasible*, the *alteration* shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an *accessible* route, unless required by Section 3411.7.
2. *Accessible means of egress* required by Chapter 10 are not required to be provided in existing facilities.
3. The *alteration* to Type A individually owned dwelling units within a Group R-2 occupancy shall be permitted to meet the provision for a *Type B dwelling unit*.
4. *Type B dwelling or sleeping units* required by Section 1107 of this code are not required to be provided in existing buildings and facilities <u>that were first occupied prior to March 13, 1991.</u> ~~undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building~~.

3411.8.9 (IEBC [B] 410.8.9) Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 *dwelling* or *sleeping units* are being added, the requirements Section 1107 for *Type B units* apply only to the quantity of the spaces being added. Where Group I-1, I-2, R-1, R-2, R-3 or R-4 *dwelling or sleeping units* <u>in buildings first occupied March 13, 1991 or later</u> are being altered and where the work area is greater than 50 percent of the aggregate area of the building, the requirements Section 1107 for *Type B units* apply only to the quantity of the spaces being altered.

Reason: To revise Section 3411.6, Exception 4 to comply with the Fair Housing Act as it applies to existing construction. The Fair Housing Act specifically applies to new buildings for first occupancy after March 13, 1991 and the requirement of Section 3411.6, Exception 4, should not apply to buildings constructed and occupied prior to the effective date of the Fair Housing Act. The section as written would place an undue burden on renovation of existing buildings as costly structural changes and other building modification needed to accommodate the accessibility provisions of the Fair Housing Act could impact the feasibility of upgrading apartments and other existing buildings that are modified to R occupancy.

Cost Impact: The proposed changes will not increase the cost of construction. Reduce the cost of construction.

G236-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.6-G-NICKSON.doc

G237 – 12

PART I – INTENATIONAL BUILDING CODE

1007.1, 3411.5, 3411.6, 3411.7, 3411.8 (NEW), 3411.8.1 (NEW) [IFC [B] 1007.1, IEBC [B] 410.5, 410.6, 410.7, 410.8(NEW), 410.8.1(NEW)]

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing himself

THIS CODE CHANGE PROPOSAL WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.5 (IEBC [B] 410.5) Additions. Provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, a primary function shall comply with the requirements in Section 3411.7 and 3411.8.

3411.6 (IEBC [B] 410.6) Alterations. A facility or element that is altered shall comply with the applicable provisions in Chapter 11 of this code, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible. Accessible means of egress complying with Section 1007 shall be provided as required in Section 3411.8.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3411.7.
~~2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.~~
~~3~~ 2. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall be permitted to meet the provision for a Type B dwelling unit.
~~4~~ 3. Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.

3411.7 (IEBC [B] 410.7) Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. ~~This provision does not apply to alterations~~ Alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. ~~This provision does not apply to alterations~~ Alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. ~~This provision does not apply to alterations~~ Alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.
5. ~~This provision does not apply to altered~~ Altered areas limited to Type B dwelling and sleeping units.

3411.8 (IEBC [B] 410.8) Accessible means of egress. Not less than one accessible means of egress shall be provided in accordance with Section 1007 and 3411.8.1 in alterations affecting an area containing a primary function and in additions.

Exceptions:

1. Existing buildings where the alterations are less than 50 percent of the aggregate building area.
2. Historic buildings.
3. Accessible means of egress is not required to exceed 20 percent of the costs of the alterations including any costs associated with compliance for Section 3411.7. Where the costs to provide accessibility cannot accommodate compliance with both this Section and Section 3411.7, Section 3411.7 shall take precedence.
4. Alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
5. Alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
6. Alterations undertaken for the primary purpose of increasing the accessibility of a facility.
7. Altered areas limited to Type B dwelling and sleeping units

3411.8.1 (IEBC [B] 410.8.1) Means of egress through the existing building. Where the accessible means of egress from an portion of a building being altered, undergoing a change of occupancy or addition requires occupants to egress through portions of the existing building, compliance with Section 1007 is required through the existing building, unless technically infeasible. Where compliance with this provision is technically infeasible, the accessible means of egress through the existing building shall provide access to the maximum extent technically feasible.

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress ~~are not required in alterations to~~ for existing buildings shall be provided as required in Section 3411.8.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with ~~sloped~~ ramped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

Reason: During last code change cycle, a proposal similar to this was presented. The committee felt it was too confusing and that it did not address the concept of disproportionate cost effectively. This proposal seeks to address those issues more clearly. Where possible the language was changed to be uniform among the various codes and sections.

Common sense should dictate that where major alterations occur consideration for at least one accessible means of egress should be provided. Additionally, the simple idea that an accessible means of egress should be intentionally denied to a segment of the population does not seem appropriate. As the codes now stand, a building can be completely gutted with only the facades remaining and no accessible means of egress must be provided.

It is important to remember that the new construction requirements in the IBC only require a maximum of two accessible means of egress as noted in Section 1007.1 (assuming travel distance compliance is accommodated).

This proposal affects sections in both eth IBC and the IEBC with the intent that the changes in the IBC are reflected in the IEBC as well.

1007.1: The first exception to the section is changed to indicate that existing building provisions are noted in Chapter 34. This is the proper scoping location for issues dealing with existing buildings – not Chapter 10. A language change is provided to the third exception based on consistency with the term usage elsewhere in the code.

3411.5/410.5: A cross reference to the section addressing accessible means of egress is added. The addition is required to comply with new construction in every other aspect. It makes sense to reference this aspect as well.
3411.6/410.6: Under the current code, the exception makes reference to Chapter 10 but the main text does not. This closes that loop. Where accessible means of egress are required, it is necessary to direct the code user to the proper section. The reference to 1007 does that. Additionally, the word “element” is included in the charging language. It was unclear previously what should be done for the specific element under an alteration. For example, if a door is being replaced with one that has a vision lite, the door surface, hardware and vision lite location are subject to the “element” portion of the requirement but the accessible route to and maneuverable approach to the door are not part of the element so they would not be required to be altered. Similarly, if new electrical controls are installed, they are subject to the mounting height requirements but the entire space is not required to be altered for any other accessible elements not being altered. This is consistent with the approach taken in the Federal 2010 ADA Standards for Accessible Design. On the other hand, if an exterior stairway is being replaced in a non-sprinklered building then the clear width between handrails should be taken into consideration in the design.
3411.6/410.6, exception #2: The exception states that nothing is required for the existing building relative to accessible means of egress. However, an addition impacts the existing building to which it is attached. Egress through the existing building from an addition is more similar to an alteration of the existing egress system. The revised text points to the new code text in 3411.8.1 for what must be done for these conditions.
3411.7/410.7: (No change)
3411.8/410.8: A new section is added to specifically address accessible means of egress. Rather than the blanket statement in Section 1007.1 of the building code, this section will address the scope and extent of work necessary to address accessible means of egress for existing buildings. It directs the code user to Section 1007 for the technical requirements when an accessible means of egress is necessary as well as clearly delineate that when an alteration occurs affecting an area containing a primary function, an accessible means of egress must be provided. This is similar to the general requirements in 3404.1/403.1 which require alterations to meet “new code.” The threshold is limited to alterations affecting a primary function because that threshold relates to the importance of changes to an area and is understood due to its relationship with the Federal accessibility regulations for the past 20 years. The intent is to provide at least one accessible means of egress.
3411.8/410.8, exception #1: Alterations with some magnitude should address accessible means of egress; if the alteration is relatively small then there is reason to limit the requirement. The threshold of 50% of the building area is intended to correspond to IEBC Alterations – Level 3. Alterations with less than 50% would not require an accessible means of egress to be provided. Even if the accessible means of egress would not be a disproportionate cost (exception #2), in small alterations the area required to create the accessible means of egress may be disproportionate to the space allowed for the alteration. If so, it may “steal” too much space from an otherwise small area and would not be appropriate.
3411.8/410.8, exception #2: The exception makes it clear that an accessible means of egress is not required for alterations to historic buildings. To do so, may alter the historic character. While an accessible means of egress should be provided wherever possible, the exception recognizes that in historic buildings the ability to make the necessary changes to comply may be detrimental to the historic integrity.
3411.8/410.8, exception #3: Existing buildings come in all shapes and sizes and the work proposed for creating an accessible means of egress can be a small part or major portion of the effort. This exception identifies that and uses the same 20% rule for the accessible route relative to the primary use area. The exception also clarifies that where funds cannot provide the accessible route *and* an accessible means of egress, it is more important to provide the accessible route. This maintains consistency with the Federal requirements for alterations affecting an area containing a primary function.
3411.8/410.8, exceptions #4, #5, #6, #7: These are the same as exceptions #2, #3, #4 and #5 in Section 3411.7 for alterations affecting an area containing a primary function. These are included here for consistency.
3411.8.1/410.8.1: If an addition is designed such that the means of egress must enter the existing building then the general rule is that the egress design in the existing building must meet the requirements for egress as it passes through the existing building. This is simply the continuation of the means of egress from the addition for egress width, panic hardware (as applicable) and similar concerns. The same should be true for the design of the accessible means of egress. If one of the accessible egress paths leads through the existing building, it too needs to meet/continue the level of protection as designed in the addition. The limitation to this is that if the effort to make the existing means of egress accessible is ”technically infeasible” then work should be done to what is possible. One example of this may be making sure that the slopes along the egress path in the existing building’s corridor are proper even if the width cannot be altered to allow the proper maneuverability approach to the exit door.

The codes identify the minimums necessary for life safety. These proposed changes provide the disabled community with similar levels of life safety to the general public and still sets reasonable thresholds based on the extent of work for the project. With the adoption of the new 2010 ADA Standards for Accessible Design, it is clear that the IBC will set the standard for accessible means of egress. This organization has a responsibility to act in the best interests of the general public and all its diversity. Where major changes are proposed to an existing building due to a large alteration or an addition, it should be the desire of the ICC to incorporate appropriate accessible means of egress where possible.

Cost Impact: The code change proposal will increase the cost of construction in many situations but may have no effect in others.

It is not easy to address what costs could be affecting this due to the myriad possible configurations for a building. A building that is a single story at grade may have no additional cost. Because an accessible entrance would be required, it would function as the accessible means of egress. Hence, a single story building with a total gut renovation may be unaffected cost-wise by this proposal.

The main costs are those involving an elevator of adequate size on emergency standby power and a two-way communications system. If the elevator is too small, the costs to alter that would be disproportionate and it would not be required according to IBC Section 3411.8, exception 2 or IEBC Section 905.4, exception #3.

At the opposite end of the spectrum could be a nine story high-rise building that is being gutted on five floors. It would be required to have an accessible route to the upper floors. The IFC would require the emergency power for fire fighter operation so that cost for that part of the accessible means of egress is covered. In that situation only the two-way communication systems costs would apply.

Buildings without elevators would likely similarly fall into the category of disproportionate costs since the addition of an elevator can be costly. Moreover, the accessible means of egress is tied into alterations that affect an area containing a primary function. This already has accessibility requirements for access such as toilet room and accessible route renovations. If the costs to add an elevator are within the 20 percent cap but the cost to add emergency standby power would be beyond the 20 percent, the exceptions in IBC Section 3411.8, exception 2 and IEBC Section 905.4, exception #3 make it clear that the costs for access take precedence over the costs for egress and that combined they are not required to exceed the 20 percent figure.

In many cases the 20 percent cap will be met by the required access features and there may be no funds remaining for an accessible egress. The important thing is that we should recognize the need to provide a means of egress for all of the occupants within the building to the greatest extent possible. No definitive numbers can be provided because the variations are so many. This discussion attempts to address the possibilities only.

Staff Note: A correlative change was proposed to IEBC Chapters 7, 9, 10 and 11.

G237-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.1 #1-E-Boecker.doc

G238 – 12
3411.7 [IEBC [B] 410.7]

Proponent: Hope Reed, New Mexico Governor's Commission on Disability (hope.reed@state.nm.us)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.7 (IEBC [B] 410.7) Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of *primary function*, the route to the primary function area shall be *accessible*. The accessible route to the *primary function* area shall include toilet facilities ~~or~~ and drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the *accessible* route are not required to exceed 20 percent of the costs of the *alterations* affecting the area of *primary function.*
2. This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to *alterations* limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to *alterations* under taken for the primary purpose of increasing the accessibility of a *facility*.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

Reason: See this same change for IEBC 310.7 and IEBC 605.2

Modify one word to comply with **2010 ADA** section 35.151(b)(4) Path of travel, and comply with **2010 ADA** section 36.403(a)(1) Path of travel.

People with disabilities need bathroom renovations and drinking fountain renovations along the "Path of Travel." When there is a choice, the easier solution is to change just the drinking fountains and look no further. The restroom renovations can be ignored. This does not benefit people with disabilities.

Those old restrooms need to be fixed and when full accessibility is not possible, some attempt at accessibility will provide a benefit to many. Widening the restroom door, installing a raised toilet, installing grab bars, and removing toilet partitions can be easy access renovations to comply with the intent of **2010 ADA**. Restroom and drinking fountain renovations need to be considered on an equal basis to comply with IBC 3411.6 where it states, "*alterations* shall provide access to the maximum extent that is technically feasible."

Cost Impact: The cost will not exceed 20% of the cost for the alteration as stated in IEBC 705.2 Exception 1. Renovations should include equal consideration of both restroom renovations and drinking fountain renovations.

The IEBC needs to help building code officials bring alteration projects closer to the 20% dollar amount. Restroom and drinking fountain renovations need to be considered on an equal basis to comply with IEBC 3411.6 where it states, "*alterations* shall provide access to the maximum extent that is technically feasible.

G238-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.7-G-REED

G239 – 12
3411.7, 3411.8 [IEBC [B] 410.7, 410.8]

Proponent: Tim Nogler, Washington State Building Code Council, representing Washington Association of Building Officials Technical Code Development Committee (tim.nogler@des.wa.gov)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.7 (IEBC [B] 410.7) Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of *primary function*, the route to the primary function area shall be *accessible*. The accessible route to the *primary function* area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the *accessible* route are not required to exceed 20 percent of the costs of the *alterations* affecting the area of *primary function*. Costs that shall be permitted to be counted as expenditures required to provide an accessible path of travel include costs associated with:
   1.1. Providing an accessible entrance and an accessible route to the altered area;
   1.2. Making restrooms accessible;
   1.3. Providing accessible telephones and
   1.4. Providing an accessible drinking fountain.
2. This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to *alterations* limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to *alterations* under taken for the primary purpose of increasing the accessibility of a *facility*.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

The costs of providing the alterations shall be based on the actual costs of the planned alteration to the area of primary function, not considering the costs of the accessible features.

3411.8 (IEBC [B] 410.8)Scoping for alterations. The provisions of Sections 3411.8.1 through 3411.8.14 shall apply to *alterations* to existing buildings and facilities.

Exception: The costs of providing the alterations in Sections 3411.8.1 and 3411.8.5 are not required to exceed 20 percent of the costs of the alterations. The costs of providing the alterations shall be based on the actual costs of the planned alteration to the area of primary function, not considering the costs of the accessible features.

Reason: The purpose of this code change is to provide clarity on how to calculate costs associated with the accessible route of travel, in order to determine if the 20 percent exception applies. This proposal also includes the 20 percent exception in the scoping for alterations, to address path of travel elements in the scoping section. We believe the intent of the 20 percent exception in the code is to prevent disproportionate costs for path of travel improvements. However, Sections 3411.8.1 and 3411.8.5 can trigger significant cost items (e.g., elevators or lifts). As written, these improvements to the path of travel are required, regardless of how much they cost in relation to the rest of the project. For example, one building official reported a case where an applicant wanted to add a stair in a ground floor restaurant on a steeply sloping site to connect two levels separated by 4 feet vertically. The plan was to cut a hole in a retaining wall and construct the stair on grade in the hole. This appeared to trigger a requirement for an elevator, since a ramp was infeasible in the space provided (Section 3411.8.4). However, the cost of the required elevator was many times the cost for installation of the stair. The elements of the accessible route to be included in the estimated cost should be specified in the code. Costs that may be counted as expenditures to provide an accessible route of travel are taken from the 2010 ADA Standards for Accessible Design. Including this list in the code will make the IBC consistent with the ADA standard.

2010 Standards: Title III
Subpart D of 28 CFR Part 36
Department of Justice

(f) Disproportionality.
(1) Alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds 20% of the cost of the alteration to the primary function area.
(2) Costs that may be counted as expenditures required to provide an accessible path of travel may include:
(i) Costs associated with providing an accessible entrance and an accessible route to the altered area, for example, the cost of widening doorways or installing ramps;
(ii) Costs associated with making restrooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes, or installing accessible faucet controls;
(iii) Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices, or installing a text telephone (TTY).
(iv) Costs associated with relocating an inaccessible drinking fountain.

Cost Impact: The proposed changes will not increase the cost of construction.

G239-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.7-G-NOGLER.doc

G240 – 12
3411.7.1 (NEW) [IEBC [B] 410.7.1 (NEW)]

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3411.7 (IEBC [B] 410.7) Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

3411.7.1 (IEBC [B] 410.7.1) Priorities. In choosing which accessible elements to provide, subject to exception #1 above, priority should be given to those elements that will provide the greatest access, in the following order:

1. An accessible entrance;
2. An accessible route to the altered area;
3. At least one accessible restroom for each sex or a single unisex restroom;
4. Accessible telephones;
5. Accessible drinking fountains; and
6. When possible, additional accessible elements such as parking, storage, and alarms.

Reason: The recent adoption of the 2010 ADA Standards for Accessible Design includes the list of priorities noted in the proposal where disproportionate cost is an issue (Subpart D of 28 CFR Section 36.403(g)(2)). Disproportionate cost is what is described in exception #1 for all of the main sections noted above.

This proposal is to coordinate with the Federal Standard. It makes sense to provide this information to the Design Professional to help in prioritizing efforts and helps the Code Official in reviewing and inspecting to verify that the most important elements are provided.

Cost Impact: This code change will not increase the cost of construction.

Staff Note: A correlative change was proposed to IEBC Section 705.2 to add a new section 705.2.1.

G240-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.7.1-G-Boecker.doc

G241 – 12
3411.8.4 [IEBC [B] 410.8.4]

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.8.4 (IEBC [B] 410.8.4) Stairs and escalators in existing buildings. In *alterations*, change of occupancy or *additions* where an escalator or *stair* is added where none existed previously and major structural modifications are necessary for installation, an *accessible* route shall be provided between the levels served by the escalator or *stairs* in accordance with ~~Sections~~ Section 1104.4 ~~and 1104.5~~.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent of this provisions is that the accessible route will be permitted to be provided in the same area as the new construction, and is not require it to be located elsewhere in the building. A reference to Section 1104.5 could require the accessible route to be provided in another part of the building is the new stairway was not on a general circulation route. A correlative change has been proposed to IEBC, Section 806.2.

Cost Impact: The proposed changes will not increase the cost of construction.

G241-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.8.4-G-BALDASSARRA-CTC.doc

G242 – 12
3411.8.6 (IEBC [B] 410.8.6)

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**3411.8.6 (IEBC [B] 410.8.6) Performance areas.** Where it is *technically infeasible* to alter performance areas to be on an *accessible* route, at least one of each type of performance area shall be made *accessible*.~~

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Existing performance areas not addressed in ADA/ABA (see ADA 206.2.6). The exception for performance area does not make a lot of sense because there are typically not multiple performance areas of the same type. If access to the stage or pit is technically infeasible, how would you do even one? We suggest deletion of IBC 3411.8.6 and IEBC 705.1.6

Cost Impact: The proposed changes will not increase the cost of construction.

G242-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.8.6-G-BALDASSARRA-CTC.doc

G243 – 12
3411.8.11 (IEBC [B] 410.8.11)

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.8.11 (IEBC [B] 410.8.11) Toilet rooms. Where it is *technically infeasible* to alter existing toilet and bathing rooms to be *accessible*, an *accessible* family or assisted-use toilet or bathing room constructed in accordance with Section 1109.2.1 is permitted. The family or assisted-use toilet or bathing room shall be located on the same floor and in the same area as the existing toilet or bathing rooms. <u>At the inaccessible toilet and bathing rooms, provide directional signs indicating the location of the nearest family or assisted-use toilet room or bathing room shall be provided. These directional signs shall include the International Symbol of Accessibility and sign characters shall meet the visual character requirements in accordance with ICC A117.1.</u>

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal will coordinate with ADA 216.8. The intent of this proposal is to add directional signage requirements for family/assisted-use bathrooms when the existing bathrooms are not fully accessible. The same proposal is being made to IBC Section IEBC 705.10.

Cost Impact: The proposed changes will not increase the cost of construction.

G243-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3411.8.11-G-BALDASSARRA-CTC.doc

G244 – 12
3412 (IEBC [B] Chapter 14)

Proponent: David S. Collins, The Preview Group, Inc., representing the American Institute of Architects (dcollins@preview-group.com); Michael A. Crowley, P.E., FSFPE, RJA Group (mcrowley@rjagroup.com)

Revise as follows:

3412.2 (IFC [B] 1401.2) Applicability. Structures existing prior to [DATE TO BE INSERTED BY THE JURISDICTION. NOTE: IT IS RECOMMENDED THAT THIS DATE COINCIDE WITH THE EFFECTIVE DATE OF BUILDING CODES WITHIN THE JURISDICTION], in which there is work involving *additions*, *alterations* or changes of occupancy shall be made to comply with the requirements of this section or the provisions of Sections 3403 through 3409. The provisions in Sections 3412.2.1 through 3412.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, I-2, M, R, S and U. These provisions shall not apply to buildings with occupancies in Group H or ~~I.~~ I-1, I-3 or I-4.

3412.6 (IFC [B] 1401.6) Evaluation process. The evaluation process specified herein shall be followed in its entirety to evaluate existing buildings in Groups A, B, E, F, M, R, S and U. For existing buildings in Group I-2, the evaluation process specified herein shall be followed and applied to each and every individual smoke compartment. Table 3412.7 shall be utilized for tabulating the results of the evaluation. References to other sections of this code indicate that compliance with those sections is required in order to gain credit in the evaluation herein outlined. In applying this section to a building with mixed occupancies, where the separation between the mixed occupancies does not qualify for any category indicated in Section 3412.6.16, the score for each occupancy shall be determined and the lower score determined for each section of the evaluation process shall apply to the entire building, or to each smoke compartment for Group I-2 occupancies.

Where the separation between mixed occupancies qualifies for any category indicated in Section 3412.6.16, the score for each occupancy shall apply to each portion, or smoke compartment of the building based on the occupancy of the space.

3412.6.2 (IFC [B] 1401.6.2) Building area. The value for building area shall be determined by the formula in Section 3412.6.2.2. Section 503 and the formula in Section 3412.6.2.1 shall be used to determine the allowable area of the building. This shall include any allowable increases due to frontage and automatic sprinklers as provided for in Section 506. Subtract the actual *building area* in square feet from the allowable area and divide by 1,200 square feet. Enter the area value and its sign (positive or negative) in Table 3412.7 under Safety Parameter 3412.6.2, Building Area, for fire safety, means of egress and general safety. In determining the area value, the maximum permitted positive value for area is 50 percent of the fire safety score as *listed* in Table 3412.8, Mandatory Safety Scores. Group I-2 occupancies shall be scored zero.

3412.6.4 (IFC [B] 1401.6.4) Tenant and dwelling unit separations. Evaluate the *fire-resistance rating* of floors and walls separating tenants, including *dwelling units*, and not evaluated under Sections 3412.6.3 and 3412.6.5. Group I-2 occupancies shall evaluate the rating of the separations between patient sleeping rooms.

Under the categories and occupancies in Table 3412.6.4, determine the appropriate value and enter that value in Table 3412.7 under Safety Parameter 3412.6.4, Tenant and Dwelling Unit Separations, for fire safety, means of egress and general safety.

TABLE 3412.6.4 (IFC [B] TABLE 1401.6.4)
SEPARATION VALUES

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1	0	0	0	0	1
I-2	0	1	2	3	4

(Portions of table not shown remain unchanged)

3412.6.5 (IFC [B] 1401.6.5) Corridor walls. Evaluate the *fire-resistance rating* and degree of completeness of walls which create *corridors* serving the floor, and constructed in accordance with Section 1018. This evaluation shall not include the wall elements considered under Sections 3412.6.3 and 3412.6.4. Under the categories and groups in Table 3412.6.5, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.5, Corridor Walls, for fire safety, means of egress and general safety.

TABLE 3412.6.5 (IFC [B] TABLE 1401.6.5)
CORRIDOR WALL VALUES

OCCUPANCY	CATEGORIES			
	a	b	c[a]	d[a]
A-1	-10	-4	0	2
I-2	-10	0	1	2

(Portions of table not shown remain unchanged)

3412.6.7 (IFC [B] 1401.6.7) HVAC systems. Evaluate the ability of the HVAC system to resist the movement of smoke and fire beyond the point of origin. Under the categories in Section 3412.6.7.1, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.7, HVAC Systems, for fire safety, means of egress and general safety. Facilities in Group I-2 occupancies meeting Categories a, b or c shall be considered to fail the evaluation.

3412.6.8 (IFC [B] 1401.6.8) Automatic fire detection. Evaluate the smoke detection capability based on the location and operation of *automatic fire detectors* in accordance with Section 907 and the *International Mechanical Code*. Under the categories and occupancies in Table 3412.6.8, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.8, Automatic Fire Detection, for fire safety, means of egress and general safety. Facilities in Group I-2 occupancies meeting Categories a, b or c shall be considered to fail the evaluation.

TABLE 3412.6.8 (IFC [B] TABLE 1401.6.8)
AUTOMATIC FIRE DETECTION VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-3, F, M, R, S-1	-10	-5	0	2	6	-
A-2	-25	-5	0	5	9	-
A-4,B,E,S-2	-4	-2	0	4	8	-
I-2	NP	NP	0	4	5	2

3412.6.8.1 (IFC [B] 1401.6.8.1) Categories. The categories for automatic fire detection are:

1. Category a—None.
2. Category b—Existing *smoke detectors* in HVAC systems and maintained in accordance with the *International Fire Code*.
3. Category c—*Smoke detectors* in HVAC systems. The detectors are installed in accordance with the requirements for new buildings in the *International Mechanical Code*.
4. Category d—*Smoke detectors* throughout all floor areas other than individual *sleeping units*, tenant spaces and *dwelling units*.
5. Category e—*Smoke detectors* installed throughout the floor area.

6. Category f – Smoke detectors in corridors only.

3412.6.9 (IFC [B] 1401.6.9) Fire alarm systems. Evaluate the capability of the *fire alarm system* in accordance with Section 907. Under the categories and occupancies in Table 3412.6.9, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.9, Fire Alarm Systems, for fire safety, means of egress and general safety.

TABLE 3412.6.9 (IFC [B] TABLE 1401.6.9)
FIRE ALARM SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a	b[a]	c	d
A-1, A-2, A-3, A-4, B, E, R	-10	-5	0	5
F, M, S	0	5	10	15
I-2	-4	1	2	5

a. For buildings equipped throughout with an automatic sprinkler system, add 2 points for activation by a sprinkler water flow device.

3412.6.10 (IFC [B] 1401.6.10) Smoke control. Evaluate the ability of a natural or mechanical venting, exhaust or pressurization system to control the movement of smoke from a fire. Under the categories and occupancies in Table 3412.6.10, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.10, Smoke Control, for means of egress and general safety.

TABLE 3412.6.10 (IFC [B] TABLE 1401.6.10)
SMOKE CONTROL VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-2, A-3	0	1	2	3	6	6
A-4, E	0	0	0	1	3	5
B, M, R	0	2(a)	3(a)	3(a)	3(a)	4(a)
F, S	0	2(a)	2(a)	3(a)	3(a)	3(a)
I-2	-4	0	0	0	3	0

a. This value shall be 0 if compliance with Category d or e in Section 3412.6.8.1 has not been obtained.

3412.6.11 (IFC [B] 1401.6.11) Means of egress capacity and number. Evaluate the *means of egress* capacity and the number of exits available to the building occupants. In applying this section, the *means of egress* are required to conform to the following sections of this code: 1003.7, 1004, 1005, 1014.2, 1014.3, 1015.2, 1021, 1024.1, 1027.2, 1027.5, 1028.2, 1028.3, 1028.4 and 1029. The number of exits credited is the number that is available to each occupant of the area being evaluated. Existing fire escapes shall be accepted as a component in the *means of egress* when conforming to Section 3406.

Under the categories and occupancies in Table 3412.6.11, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.11, Means of Egress Capacity, for means of egress and general safety.

TABLE 3412.6.11 (IFC [B] TABLE 1401.6.11)
MEANS OF EGRESS VALUES

OCCUPANCY	CATEGORIES				
	a[a]	b	c	d	e
A-1, A-2, A-3, A-4, E	-10	0	2	8	10
M	-3	0	1	2	4
B, F, S	-1	0	0	0	0
R	-3	0	0	0	0
I-2	-10	0	2	8	10

a. The values indicated are for buildings six stories or less in height. For buildings over six stories above grade plane, add an additional -10 points.

3412.6.12 (IFC [B] 1401.6.12) Dead ends. In spaces required to be served by more than one *means of egress*, evaluate the length of the *exit* access travel path in which the building occupants are confined to a single path of travel. Under the categories and occupancies in Table 3412.6.12, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.12, Dead Ends, for means of egress and general safety.

TABLE 3412.6.12 (IFC [B] TABLE 1401.6.12)
DEAD-END VALUES

OCCUPANCY	CATEGORIES			
	a	**b**	**c**	**d**
A-1, A-3, A-4, B, E, F, M, R, S	-2	0	2	-
A-2, E	-2	0	2	-
I-2	-2	0	2	-6

a. For dead-end distances between categories, the dead-end value shall be obtained by linear interpolation.

3412.6.12.1 (IFC [B] 1401.6.12.1) Categories. The categories for dead ends are:

1. Category a—Dead end of 35 feet (10 670 mm) in nonsprinklered buildings or 70 feet (21 340 mm) in sprinklered buildings.
2. Category b—Dead end of 20 feet (6096 mm); or 50 feet (15 240 mm) in Group B in accordance with Section 1018.4, exception 2.
3. Category c—No dead ends; or ratio of length to width (l/w) is less than 2.5:1.
4. Category d – Dead ends exceeding Category a.

3412.6.16 (IFC [B] 1401.6.16) Mixed occupancies. Where a building has two or more occupancies that are not in the same occupancy classification, the separation between the mixed occupancies shall be evaluated in accordance with this section. Where there is no separation between the mixed occupancies or the separation between mixed occupancies does not qualify for any of the categories indicated in Section 3412.6.16.1, the building shall be evaluated as indicated in Section 3412.6 and the value for mixed occupancies shall be zero. Under the categories and occupancies in Table 3412.6.16, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.16, Mixed Occupancies, for fire safety and general safety. For buildings without mixed occupancies, the value shall be zero.

3412.6.16.1 (IFC [B] 1401.6.16.1) Categories. The categories for mixed occupancies are:

1. Category a—Occupancies separated by minimum 1-hour *fire barriers* or minimum 1-hour *horizontal assemblies*, or both.
2. Category b—Separations between occupancies in accordance with Section 508.4.
3. Category c—Separations between occupancies having a *fire-resistance rating* of not less than twice that required by Section 508.4.4.

TABLE 3412.6.16 (IFC [B] TABLE 1401.6.16)
MIXED OCCUPANCY VALUES[a]

OCCUPANCY	CATEGORIES		
	a	**b**	**c**
A-1, A-2, R	-10	0	10
A-3, A-4, B, E, F, M, S	-5	0	5
I-2	NP	0	5

a. For fire-resistance ratings between categories, the value shall be obtained by linear interpolation.

3412.6.17 (IFC [B] 1401.6.17) Automatic sprinklers. Evaluate the ability to suppress a fire based on the installation of an *automatic sprinkler system* in accordance with Section 903.3.1.1. “Required sprinklers” shall be based on the requirements of this code. Under the categories and occupancies in Table 3412.6.17, determine the appropriate value and enter that value into Table 3412.7 under Safety

Parameter 3412.6.17, Automatic Sprinklers, for fire safety, means of egress divided by 2 and general safety.

TABLE 3412.6.17 (IFC [B] TABLE 1401.6.17)
SPRINKLER SYSTEM VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-3, F, M, R, S-1	-6	-3	0	2	4	6
A-2	-4	-2	0	1	2	4
A-4, B, E, S-2	-12	-6	0	3	6	12
I-2	NP	NP	NP	8	10	NA

NP not permitted
NA not applicable

3412.6.18 (IFC [B] 1401.6.18) Standpipes. Evaluate the ability to initiate attack on a fire by making a supply of water available readily through the installation of standpipes in accordance with Section 905. Required standpipes shall be based on the requirements of this code. Under the categories and occupancies in Table 3412.6.18, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.18, Standpipes, for fire safety, means of egress and general safety.

TABLE 3412.6.18 (IFC [B] TABLE 1401.6.18)
STANDPIPE SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a[a]	b	c	d
A-1, A-3, F, M, R, S-1	-6	0	4	6
A-2	-4	0	2	4
A-4, B, E, S-2	-12	0	6	12
I-2	-2	0	1	2

a. This option cannot be taken if Category a or b in Section 3412.6.17 is used.

3412.6.20 (IFC [B] 1401.6.20) Smoke Compartmentation. Evaluate the smoke compartments for compliance with Section 417.5. Using Table 3412.6.20, determine the appropriate smoke compartmentation value (*SCV*) and enter that value into Table 3412.7 under Safety Parameter 3412.6.20, Smoke Compartmentation, for fire safety, means of egress and general safety.

TABLE 3412.6.20 (IFC [B] TABLE 1401.6.20)
SMOKE COMPARTMENTATION VALUES

OCCUPANCY	CATEGORIES[a]		
	a Compartment size equal to or less than 22,500 square feet	b Compartment size greater than 22,500 square feet	c No smoke Compartment
A, B, E, F, M, R and S	0	0	0
I-2	0	NP	NP

For SI: 1 square foot = 0.093 m^2.
a. For areas between categories, the smoke compartmentation value shall be obtained by linear interpolation.

3412.6.21 (IFC [B] 1401.6.21) Patient ability, concentration, smoke compartment location and ratio to attendant. In I-2 occupancies, the ability of patients, their concentration and ratio to attendants shall be evaluated and applied per this section. Evaluate each smoke compartment using the categories in Sections 3412.6.21.1, 3412.6.21.2 and 3412.6.21.3 and enter the value in Table 3412.8. To determine the safety factor, multiply the three values together, if the sum is 9 or greater, compliance has failed.

3412.6.21.1 (IFC [B] 1401.6.21.1) Patient ability for self-preservation. Evaluate the ability of the patients for self-preservation in each smoke compartment in an emergency. Under the categories and occupancies in Table 3412.6.21.1 determine the appropriate value and enter that value in Table 3412.7

under Safety Parameter 3412.6.21.1, Patient Ability for Self-Preservation, for means of egress and general safety.

3412.6.21.1.1 (IFC [B] 1401.6.21.1.1) Categories: The categories for patient ability for self-preservation are:

1. Category a – (mobile) Patients are capable of self preservation without assistance.
3. Category c – (not mobile) Patients rely on assistance for evacuation or relocation.
4. Category d – (not movable) Patients cannot be evacuated or relocated

TABLE 3412.6.21.1 (IFC [B] TABLE 1401.6.21.1)
PATIENT ABILITY VALUES

OCCUPANCY	CATEGORIES		
	a	b	c
I-2	1	2	3

3412.6.21.2 (IFC [B] 1401.6.21.2) Patient Concentration. Evaluate the concentration of patients in each smoke compartment under Section 3412.6.21.2. Under the categories and occupancies in Table 3412.6.21.2 determine the appropriate value and enter that value in Table 3412.7 under Safety Parameter 3412.6.21.2, Patient Concentration, for means of egress and general safety.

3412.6.21.2.1 (IFC [B] 1401.6.21.2.1) Categories: The categories for patient concentration are:

1. Category a – smoke compartment has 1 to 10 patients.
2. Category b – smoke compartment has more than 10 to 40 patients
3. Category d – smoke compartment has greater than 40 patients

TABLE 3412.6.21.2 (IFC [B] TABLE 1401.6.21.2)
PATIENT CONCENTRATION VALUES

OCCUPANCY	CATEGORIES		
	a	b	c
I-2	1	2	3

3412.6.21.3 (IFC [B] 1401.6.21.3) Attendant-to-Patient Ratio. Evaluate the attendant-to-patient ratio for each compartment under Section 3412.6.21.3. Under the categories and occupancies in Table 3412.6.21.3 determine the appropriate value and enter that value in Table 3412.7 under Safety Parameter 3412.6.21.3, Attendant-to-Patient Ratio, for means of egress and general safety.

3412.6.21.3.1 (IFC [B] 1401.6.21.3.1) Categories: The categories for attendant-to-patient concentrations are:

1. Category a – attendant-to-patient concentrations is 1:5.
3. Category b – attendant-to-patient concentrations is 1:6 to 1:10.
4. Category c – attendant-to-patient concentrations is greater than 1:10 or no patients

TABLE 3412.6.21.3 (IFC [B] 1401.6.21.3)
ATTENDANT-TO-PATIENT RATIO VALUES

OCCUPANCY	CATEGORIES		
	a	b	c
I-2	1	2	3

TABLE 3412.7 (IFC [B] 1401.7)
SUMMARY SHEET – BUILDING CODE

Existing occupancy		____________________________________
Proposed occupancy		____________________________________
Year building was constructed		____________________________________
Number of stories		____________________________________
Height in feet		____________________________________
Type of construction		____________________________________
Area per floor		____________________________________
Percentage of open perimeter increase		___________%
Completely suppressed:		Yes_______ No ______
Type		____________________________________
Corridor wall rating		____________________________________
Compartmentation:		Yes_______ No ______
Required door closers:		Yes_______ No ______
Fire-resistance rating of vertical opening enclosures		____________________________________
Type of HVAC system:		____________________________________
Serving number of floors		__________________
Automatic fire detection:		Yes_______ No ______
Type and location		____
Fire alarm system:		Yes_______ No ______
Type		____
Smoke control:		Yes_______ No ______
Type		____
Adequate exit routes:		Yes_______ No ______
Dead ends:		Yes_______ No ______
Maximum exit access travel distance		______________________
Elevator controls:		Yes_______ No ______
Means of egress emergency lighting:		Yes_______ No ______
Mixed occupancies:		Yes_______ No ______
Standpipes:		Yes_______ No ______
Incidental Use:		Yes_______ No ______
Smoke Compartmentation less than 22,500		Yes_______ No______
Patient Ability for Self-preservation:		______________________
Patient Concentration:		______________________
Attendant-to-Patient Ratio:		______________________

3412.8 (IFC [B] 1401.8) Safety scores. The values in Table 3412.8 are the required mandatory safety scores for the evaluation process listed in Section 3412.6.

TABLE 3412.8 (IFC [B] 1401.8)
MANDATORY SAFETY SCORES[a]

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
I-2	19	34	34

a.
MFS = Mandatory Fire Safety;
MME = Mandatory Means of Egress;
MGS = Mandatory General Safety.

(Portions of table not shown remain unchanged)

Reason: When initially developed, Chapter 34 did not include provisions for I-2 or H occupancies. The rationale was that the life safety system developed by NFPA was adequate for those I-2 occupancies and H occupancies were not likely to be a part of a building renovation, nor were the drafters of the original code change comfortable with development of values for an H occupancy.

Recently, ICC and ASHE have begun working together to develop changes to the IBC to remove some of the conflicts that exist between the I-Codes and the licensing and funding standards used for hospitals. Part of that effort included discussion of the process for evaluation of an existing I-2. A small group of volunteers has developed this code change to incorporate I-2 into Chapter 34's compliance alternatives.

The ongoing issue is how to identify the appropriate levels of performance and how to integrate the criteria in in Chapter 34. The following is an approach identified by the volunteers demonstrating how this can best be achieved. The original Chapter 34 used "risk factors" as an element of the analysis. Chapter 34 was developed using risk factors that formed the basis for development of the BOCA building code and the criteria in NYC Local Law 5 for high-rise business occupancies. Other occupancies were extrapolated using those numbers.

When the IBC was developed a "zero based" revision was undertaken to establish compliance as a zero in all categories of compliance in Chapter 34's compliance alternatives. Values have been inserted into the categories where Chapter 34 is silent. Additional text has been developed to describe how these categories will be satisfied and some categories have been added to address specific elements of an existing I-2 occupancy which should play a role in achieving compliance.

Because the building is an existing I-2, elements that would not be known in a new building such as the ability of the patients or the number of persons providing care are documented as part of the ongoing licensing for these facilities. (WHAT DO WE DO ABOUT CHANGE OF OCCUPANCY?)

Evaluations were performed on several existing buildings to determine the appropriateness of the scoring. Areas of evaluation which would be untenable for typical patients and other persons in an I-2 occupancy were found and successful changes to upgrade the facility were identified, although not all would pass.

Cost Impact: The increased utility of Chapter 34 to address an I-2 occupancy will significantly reduce the cost of design and review.

G244-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3412.2-G-COLLINS-CROWLEY.doc

G245 – 12
3412.2.5 (IEBC [B] 1401.2.5)

Proponent: Carl Baldassarra, P.E., FSFPE Chair, ICC Code Technology Committee (CTC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3412.2.5 (IEBC [B] 1401.2.5) Accessibility requirements. ~~All portions of the buildings proposed for change of occupancy shall conform to the accessibility provisions of Section 3411.~~ <u>Accessibility shall be provided in accordance with Section 3411 (IEBC [B] 410 or 605).</u>

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

All existing buildings using the performance compliance alternative should meet the accessibility provisions for existing building, not just those undergoing a change of occupancy.

Cost Impact: The proposed changes will not increase the cost of construction.

G245-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3412.2.5-G-BALDASSARRA-CTC.doc

G246 – 12

3412.3.2, Table 3412.3.2 (NEW) [IEBC [B] 1401.3.2, Table 1401.3.2 (NEW)]

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

3412.3.2 (IEBC [B] 1401.3.2) Compliance with other codes. Buildings that are evaluated in accordance with this section shall comply with the *International Fire Code* and the *International Property Maintenance Code*.

When required in the *International Fire Code*, Chapter 11, once identified as deficient, the following sections shall be brought into compliance with the applicable section of that code as specified in Table 3412.3.2.

Table 3412.3.2 (IEBC [B] 1401.3.2)

Applicable Section/Title	**International Fire Code, Chapter 11, Construction requirements for existing buildings**
3412.6.5 – Corridor walls	See Section 1104.17
3412.6.6 – Vertical openings	See Section 1103.4
3412.6.8 – Automatic fire detection	See Sections 1103.7, 1103.8 and 1103.9
3412.6.9 – Fire alarm systems	See Sections 1103.7, 1103.8 and 1103.9
3412.6.12 – Dead ends	See Section 1104.17.2
3412.6.13 – Maximum exit access travel distance	See Section 1104.18
3412.6.14 – Elevator control	See Section 1103.3
3412.6.15 – Means of egress emergency lighting	See Sections 1104.3, 1104.4 and 1104.5
3412.6.17 – Automatic sprinklers	See Section 1103.5
3412.6.18 – Standpipes	See Section 1103.6

Reason: IBC Section 3412.3.2 (IEBC Section 1401.3.2) state "Buildings that are evaluated in accordance with this section shall comply with the *International Fire Code* and the *International Property Maintenance Code*." However, when comparing these provisions with the IFC, there are sections that do not comply.

The commentary for dead end corridors actually states "These distances correspond to the dead-end lengths listed in the IFC" Yet IFC Table 1104.17.2 has no 70' allowable dead end corridor and very few that are allowed 35'. Therefore, it is possible that correlation between this section and the IFC has become outdated and misleading.

Some of the provisions are in conflict with the IFC Chapter 11. Once these discrepancies are identified in a building review, it would seem appropriate that those items be corrected and brought to the minimum required standards, if IFC Chapter 11 is applicable.

In order to insure that a building is not approved under this chapter, but also be found in violation of the Fire Code, a more direct link would seem appropriate to prevent confusion and/or errors from happening.

Cost Impact: This code change will not increase the cost of construction since the provisions already exist and are applicable if the Fire Code is adopted.

G246-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

3412.3.2-G-GODWIN

G247 – 12
Table 3412.6.19 [IEBC Table 1401.6.19]

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee (BCAC)

Revise as follows:

TABLE 3412.6.19 (IEBC [B] Table 1401.6.19)
INCIDENTAL USE AREA VALUES[a]

PROTECTION REQUIRED BY TABLE 509	PROTECTION PROVIDED						
	None	**1 Hour**	**AS**	**AS with ~~SP~~ CRS**	**1 Hour and AS**	**2 Hours**	**2 Hours and AS**
2 Hours and AS	-4	-3	-2	-2	-1	-2	0
2 Hours, or 1 Hour and AS	-3	-2	-1	-1	0	0	0
1 Hour and AS	-3	-2	-1	-1	0	-1	0
1 Hour	-1	0	-1	0	0	0	0
1 Hour, or AS with ~~SP~~ CRS	-1	0	-1	0	0	0	0
AS with ~~SP~~ CRS	-1	-1	-1	0	0	-1	0
1 Hour or AS	-1	0	0	0	0	0	0

a. AS = Automatic sprinkler system; ~~SP~~ CRS = ~~Smoke partitions~~ Construction capable of resisting the passage of smoke (See Section 509.4.2).

Reason: This code proposal makes no changes to the current requirements in the Code. This proposal is intended to be editorial and clarify the existing provisions in Table 3412.6.19.
Editorial revisions are made as follows:
1. The reference in the 1st Column Heading in this Table – the reference should be to Table 509 in the 2012 IBC, not to Table 508.2.5, which was the old location in the 2009 IBC.
2. The section reference in Footnote 'a' – the reference should be to "See IBC Section 509.4.2" in the 2012 IBC. Again, Section 508.2.5 was the old location in the 2009 IBC.

The use of "SP", and the reference to "smoke partitions" in three locations is proposed to be revised to correlate with the current requirements in IBC Section 509.4.2. The text in Section 3412.6.19 refers to protection of incidental uses in accordance with Section 509.4.2. Section 509.4.2 does not require smoke partitions. Section 509.4.2 requires separation by construction capable of resisting the passage of smoke. To be consistent with the requirements in Section 509.4.2, and so as not to create confusion with smoke partition requirements in Section 710, the proposed revision will replace the term "SP" (smoke partition), with the term "CRS" (capable of resisting the passage of smoke). This proposal clarifies that the construction needs to be capable of resisting the passage of smoke rather than be constructed as a smoke partition.

The revisions are made in IBC Table 3412.6.19 and the duplicate table in the IEBC.

Cost Impact: The code change proposal will not increase the cost of construction.

G247-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T3412 6 19-G-Bajnai-BCAC.doc

G248 – 12
H106.1, Chapter 35 (NEW)

Proponent: Bob Eugene, Underwriters Laboratories (robert.eugnee@ul.com)

Revise as follows:

H106.1 Illumination. A sign shall not be illuminated by other than electrical means, and electrical devices and wiring shall be installed in accordance with the requirements of NFPA 70. Any open spark or flame shall not be used for display purposes unless specifically approved. Electric signs shall be listed and labeled in accordance with UL 48.

> **Exception:** Exit signs installed in accordance with Section 1011.

Add new standard to Chapter 35 as follows:

UL
UL 48-2011 Electric Signs

Reason: None .UL 48 is the ANSI approved standard for electric signs. Although NFPA 70 Section 600-3 requires listing, it does not specify the applicable standard within the mandatory provisions of the code. Electrically supplied exit signs are listed in accordance with UL 924.

Cost Impact: The proposed changes will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, UL 48-2011 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

G248-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

H106.1-G-EUGENE.doc

G249 – 12
H106.1.1

Proponent: Richard Crawford, Mercer Sign Consultants, representing United States Sign Council (rcmercer@verizon.net) or (rick@ussc.org)

Revise as follows:

H106.1.1 Internally illuminated signs. Except as provided for in Sections 402.16 and 2611, where internally illuminated signs have facings of wood or approved plastic, the area of such facing section shall not be more than ~~120~~ 200 square feet ~~(11.16 m^2)~~ (18.58m^2) and the wiring for electric lighting shall be entirely enclosed in the sign cabinet with a clearance of not less than 2 inches (51 mm) from the facing material. The dimensional limitation of ~~120~~ 200 square feet ~~(11.16 m^2)~~ (18.58m^2) shall not apply to sign facing sections made from flame-resistant-coated fabric (ordinarily known as "flexible sign face plastic") that weighs less than 20 ounces per square yard (678 g/m^2) and that, when tested in accordance with NFPA 701, meets the fire propagation performance requirements of both Test 1 and Test 2 or that when tested in accordance with an approved test method, exhibits an average burn time of 2 seconds or less and a burning extent of 5.9 inches (150 mm) or less for 10 specimens.

Reason: Internally illuminated signs are safely and professionally installed at over 120 SF on a regular basis, and any potential constructions issues are routinely addressed by proper engineering and fabrication techniques. Many existing internally illuminated sign installations would not comply with this Appendix Section, though they are safe and competently designed and installed. The value originally inserted in the Appendix H 106.1.1 was arbitrary and was not supported by direct research or practical sign fabrication experience. This adjustment will permit continuing reasonable internally illuminated sign sizes. In addition, so-called flexible sign faces present advantages in large installations, but can present other issues in terms of secural, repairs and maintenance.

Cost Impact: The code change proposal will not increase the cost of construction.

G249-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

H106.1.1-G-CRAWFORD.doc

G250 – 12
H109.2

Proponent: Richard Crawford, Mercer Sign Consultants, representing United States Sign Council (rcmercer@verizon.net) or (rick@ussc.org)

Delete without substitution as follows:

~~**H109.2 Required clearance.** The bottom coping of every ground sign shall be not less than 3 feet (914 mm) above the ground or street level, which space can be filled with platform decorative trim or light wooden construction.~~

(Renumber subsequent sections)

Reason: The height above grade established by this provision creates extreme complications and hardships in dealing with ground sign size, sign area, and overall ground sign height. Since the original adoption of Appendix H, many jurisdictions have gone on to implement ground sign height restrictions at 5'-0" to 6'-0" above grade maximum. The copy or communication or identification on these ground signs therefore must be placed lower than 3'-0" above grade by necessity, and by operation of local code. These practical considerations conflict with Section 109.2. It is not anticipated that jurisdictions will be amending their sign codes to allow reasonable implementation of Section 109.2 at any time in the near future. Therefore, H 109.2 should be deleted as it is in opposition to countless zoning and building codes related to ground signs across the country.

Cost Impact: The code change proposal will not increase the cost of construction.

G250-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

H109.2-G-CRAWFORD.doc

G251 – 12
H111.1

Proponent: Richard Crawford, Mercer Sign Consultants, representing United States Sign Council (rcmercer@verizon.net) or (rick@ussc.org)

Revise as follows:

H111.1 Materials. Wall signs which have an area exceeding ~~40~~ 100 square feet ~~(3.72 m^2)~~ (9.29 m^2) shall be constructed of metal or other approved noncombustible material, except for nailing rails and as provided for in Sections H106.1.1 and H107.1.

Reason: Wall signs are safely and professionally installed at over 40 SF in size using wood or wood-like materials. This existing Code provision is overly restrictive. Many existing Wall sign installations would not comply with this Appendix Section, though they are safe and professionally designed and installed. The value originally inserted in the Appendix H 111.1 was arbitrary and was not supported by direct research or practical sign fabrication experience. This adjustment will permit continuing reasonable Wall sign sizes in wood or similar materials.

Cost Impact: The code change proposal will not increase the cost of construction.

G251-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

H111.1-G-CRAWFORD.doc

G252 – 12
APPENDIX L (NEW)

Proponent: Proponent: Stephen V. Skalko Portland Cement Association and Jason Thompson National Concrete Masonry Association representing the Masonry Alliance for Codes and Standards

Add new Appendix L as follows:

APPENDIX L
BUILDING RESILIENCE

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION L101
GENERAL

L101.1 Purpose. The purpose of this appendix is to promote enhanced public health, safety and general welfare and to reduce public and private property losses due to hazards and natural disasters associated with fires, flooding, high winds and earthquakes.

SECTION L102
BUILDING HEIGHTS AND AREA

L102.1General. *Building height and areas* shall comply with Sections L102.1 through L102.4.

L102.2 Height and Area Limitations. Allowable heights and areas for all *buildings* shall be in accordance with Table L102.2.

TABLE L102.2
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane. Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION					
		Type I		Type II	Type III	Type IV	Type V
	HGT	A	B	A	A	HT	A
	(feet)	UL	160	65	65	65	50
GROUP		STORIES (S) Area (A)					
A-1	S A	UL UL	5 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-2	S A	UL UL	11 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-3	S A	UL UL	11 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-4	S A	UL UL	11 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL
B	S A	UL UL	11 UL	5 37,500	5 28,500	5 36,000	3 18,000
E	S A	UL UL	5 UL	3 26,500	3 23,500	3 25,500	1 18,500

GROUP	HGT (feet)	TYPE OF CONSTRUCTION					
		Type I		Type II	Type III	Type IV	Type V
		A	B	A	A	HT	A
		UL	160	65	65	65	50
	STORIES (S) Area (A)						
F-1	S A	UL UL	11 UL	4 25,000	3 19,000	4 33,500	2 14,000
F-2	S A	UL UL	11 UL	5 37,500	4 28,500	5 50,500	3 21,000
H-1	S A	1 21,000	1 16,500	1 11,000	1 9,500	1 10,500	1 7,500
H-2[d]	S A	UL 21,000	3 16,500	2 11,000	2 9,500	2 10,500	1 7,500
H-3[d]	S A	UL UL	6 60,000	4 26,500	4 17,500	4 25,500	2 10,000
H-4	S A	UL UL	7 UL	5 37,500	5 28,500	5 36,000	3 18,000
H-5	S A	4 UL	4 UL	3 37,500	3 28,500	3 36,000	3 18,000
I-1	S A	UL UL	9 55,000	4 19,000	4 16,500	4 18,000	3 10,500
I-2	S A	UL UL	4 UL	2 15,000	1 12,000	1 12,000	1 9,500
I-3	S A	UL UL	4 UL	2 15,000	2 10,500	2 12,000	2 7,500
I-4	S A	UL UL	5 60,500	3 26,500	3 23,500	3 25,500	1 18,500
M	S A	UL UL	11 UL	4 21,500	4 18,500	4 20,500	3 14,000
S-1	S A	UL UL	11 48,000	4 26,000	3 26,000	4 25,500	3 14,000
S-2[b, c]	S A	UL UL	11 79,000	5 39,000	4 39,000	5 38,500	4 21,000
U[c]	S A	UL UL	5 35,500	4 19,000	3 14,000	4 18,000	2 9,000

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.
UL = Unlimited, NP = Not permitted.
a. See the following sections for general exceptions to Table L102.1:
   1. Section 506.2, Allowable area increase due to street frontage of the IBC.
   2. Section 507, Unlimited area buildings of the IBC.
b. For open parking structures, see Section 406.5 of the IBC.
c. For private garages, see Section 406.3 of the IBC.
d. See Section 4157 for limitations of the IBC.

L102.3 Building Height and Area Increases. Increases in building height in accordance with Section 504.2 shall not be permitted. Increases in building area in accordance with Section 506.3 shall not be permitted.

L102.4 Single occupancy buildings with more than one story. Exception 2 of Section 506.4.1 shall not be permitted.

SECTION L103
TYPES OF CONSTRUCTION

L103.1 General. B*uilding* type of construction shall comply with Section L103.2.

L103.2 Fire-Resistance Rating. Building elements shall have a fire resistance rating not less than that specified in Table L103.2 and exterior walls shall have a fire resistance rating not less than that specified in Table 602,

TABLE L103.2
FIRE-RESISTANCE RATING FOR BUILDING ELEMENTS (HOURS)[a]

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary Structural Frame[g,h]	3[b]	2[b]	1	NP	1	NP	HT	1	NP
Bearing Walls Exterior[f,g] Interior	 3 3[b]	 2 2[b]	 1 1	 NP NP	 2 1	 NP NP	 2 1/HT	 1 1	 NP NP
Non-bearing Walls and Partitions Exterior	See Table 602 of the *IBC*								
Non-bearing Walls and Partitions[e] Interior	0	0	0	NP	0	NP	See Section 602.4.6 of the *IBC*	0	NP
Floor Construction and Secondary Members[h]	2	2	1	NP	1	NP	HT	1	NP
Roof Construction and Secondary Members[h]	1-1/2[b]	1[c,d]	1[c,d]	NP	1[c,d]	NP	HT	1[c,d]	NP

For SI: 1 foot = 304.8 mm.
NP = Not Permitted.
a. The requirements in this table take precedence over Table 601,
b. Roof supports: Fire-resistance rating of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
c. Fire protection of structural members hall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire retardant wood members shall be allowed to be used for such unprotected members.
d. In all occupancies, heavy timber shall be allowed where 1-hour or less fire-resistance rating is required.
e. Not less than the fire-resistance rating required by other Sections of the code [f] Not less than the fire-resistance rating based on fire separation distance (see Table 602 [g] Not less than the fire-resistance rating as referenced in Section 704.10 [h] See Section 202

SECTION L104
FIRE PROTECTION SYSTEMS

L104.1 General. B*uilding* fire protection systems shall comply with Section L104.2.

L104.2 Automatic Sprinkler Protection. An *approved automatic sprinkler system* shall be provided throughout all new buildings in accordance with Section 903.

Exceptions:

1. All Group F-2 occupancies
2. In Group S-2 Occupancies located in close proximity to a Group F-2 occupancy where the noncombustible products that are manufactured in the Group F-2 building are stored, the sprinkler protection shall be permitted to be omitted when *approved* by the *building official.*
3. Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided those spaces or areas are equipped throughout with an automatic fire alarm system and are separated from the remainder of the building by fire barriers consisting of not less than 1-hour fire-resistance-rated walls and 2-hour fire-resistance-rated horizontal assemblies.

L104.2.1 Automatic Sprinkler Systems. Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1. Sprinkler systems designed and installed in accordance with Section 903.3.1.2 shall not be permitted.

Reason: This reason statement has the following two segments to explain the reasons for this change: (A) The code change is explained with specific substantiation; and (B) General background information identifying the need for enhanced property protection and functional resilience for to strengthen the built environment;

(A) The following are reports of dollar loss to property from wind, cold weather and fire disasters.

- The American Society of Civil Engineers reported in *Normalized Hurricane Damage in the United States*, *1900 – 2005,* National Hazard Review, ASCE 2008, that property damage from hurricanes was 81 billion dollars in 2005.
- The National Weather Service reports that U.S. property damage due to winter storms and ice exceeded 1.5 billion dollars in 2009.
- *Fire Losses in the United States During 2009* by the National Fire Protection Association, August 2010 shows that property loss due to structure fires in buildings other than one and two family dwellings was approximately 4.5 billion dollars.

Increasing the stringency of the design criteria of buildings for hazards such as wind, snow or fire results in more robust buildings. Such requirements reduce the amount of energy and resources required for repair, removal, disposal and replacement of building components and systems damaged from these disasters. A further benefit is a reduction in the amount of damaged building materials and content entering landfills.

Additional benefits are enhanced life safety, security and occupant comfort; potentially less demand on community resources required for emergency response; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future.

(B) Minimum building requirements whether through energy codes, plumbing codes, mechanical codes, zoning codes, or basic building codes, do not encourage truly sustainable buildings. This proposal is one of several that attempt to integrate the concepts of the *Whole Building Design Guide* (WBDG) into the International Building Code as a non-mandatory Appendix. This allows adopting jurisdictions the option of incorporating code requirements into the building code to improve the resilience of the built environment without the need to add another code to the community requirements.

The WBDG, developed in partnership between the National Institute of Building Sciences (NIBS) and the Sustainable Building Industries Council (SBIC), has as its key concepts: accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable.

There are numerous references about the economic, societal, and environmental benefits that result when enhanced functional resilience for resource minimization are integrated into building design and construction. Six examples demonstrating the importance and supporting the concepts are:

1. ***Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities***
   National Institute of Building Sciences Multi-Hazard Mitigation Council - 2005
   One of the findings in this report is "The analysis of the statistically representative sample of FEMA grants awarded during the study period indicates that a dollar spent on disaster mitigation saves society an average of $4." The programs studied often addressed issues and strategies other than enhanced disaster resistance of buildings and other structures. However, more disaster-resistant buildings enhance life safety; reduce costs and environmental impacts associated with repair, removal, disposal, and replacement; and reduce the time and resources required for community recovery.
2. ***Five Years Later – Are we better prepared?***
   Institute for Business and Home Safety - 2010
   This IBHS report states: "When Hurricane Katrina made landfall on Aug. 29, 2005, it caused an estimated $41.1 billion in insured losses across six states, and took an incalculable economic and social toll on many communities. Five years later, the recovery continues and some residents in the most severely affected states of Alabama, Louisiana and Mississippi are still struggling. There is no question that no one wants a repeat performance of this devastating event that left at least 1,300 people dead. Yet, the steps taken to improve the quality of the building stock, whether through rebuilding or new construction, call into question the commitment of some key stakeholders to ensuring that past mistakes are not repeated." This report indicates that there is a need to implement provisions to make buildings more disaster-resistant. Clearly this suggests that functional resilience should at least be integrated into the design and construction of sustainable buildings.
3. **National Weather Service Office of Climate, Water and Weather Services**
   National Oceanic and Atmospheric Administration (NOAA) - 2010
   Data provided on the NOAA website [www.weather.gov/os/hazstats.shtml] indicates that the average annual direct property loss due to natural disasters in the United States exceeds of $35,000,000,000. This does not include indirect costs associated with loss of residences, business closures, and resources expended for emergency response and management. These direct property losses also do not reflect the direct environmental impact due to reconstruction after the disasters. Functional resilience will help alleviate the environmental impact and minimize both direct and indirect losses from natural disasters.
4. ***Global Climate Change Impacts in the United States***
   U.S. Global Change Research Program (USGCRP) - 2009
   The USGCRP includes the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation; National Aeronautic and Space Administration; Environmental Protection Agency, USA International Development, National Science Foundation and Smithsonian Institution
   The report identifies that: "Climate changes are underway in the United States and are projected to grow. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons,

lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow." The report further identifies that the: "Threats to human health will increase. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts." Key messages in the report on societal impacts include:

- "City residents and city infrastructure have unique vulnerabilities to climate change. "
- "Climate change affects communities through changes in climate-sensitive resources that occur both locally and at great distances."
- "Insurance is one of the industries particularly vulnerable to increasing extreme weather events such as severe storms, but it can also help society manage the risks."

Sustainable building design and construction cannot be about protecting the natural environment without consideration of the projected growth in severe weather. Minimum codes primarily based on past natural events are not appropriate for truly sustainable buildings. Buildings expected to have long term positive impacts on the environment must be protected from these extreme changes in the natural environment. The provisions for improved property protections are necessary to reduce the amount of energy and resources associated with repair, removal, disposal, and replacement due to routine maintenance and damage from disasters. Further such provisions reduce the time and resources required for community disaster recovery.

5. ***Sustainable Stewardship -*** *Historic preservation plays an essential role in fighting climate change , Traditional Building,* National Trust for Historic Preservation - 2008
   In the article Richard Moe summarizes the results of a study by the Brookings Institution which projects that by 2030 we will have demolished and replaced 82 billion square feet of our current building stock, or nearly 1/3 of our existing buildings, largely because the vast majority of them weren't designed and built to last any longer. Durability, as a component of functional resilience, can reduce these losses.
6. **Opportunities for Integrating Disaster Mitigation and Energy Retrofit Programs**
   Senate Environment and Public Works Committee Room, Dirksen Senate Office Building, Washington, D.C. - 2010
   During this panel discussion a representative of the National Conference of State Historic Preservation Officers noted that more robust buildings erected prior to 1950 tend to be more adaptable for reuse and renovation. Prior to the mid-1950s most local jurisdictions developed their own building code requirements that uniquely addressed the community's needs, issues and concerns. Pre-1950 building codes typically resulted in more durable and robust construction that lasts longer.

The total environmental impact of insulation, high efficiency equipment, components, and appliances, low-flow plumbing fixtures, and other building materials and contents are relatively insignificant when rendered irreparable or contaminated and must be disposed of in landfills after disasters. The US Army Corps of Engineers estimated that after Hurricane Katrina nearly 1.2 billion cubic feet of building materials and contents ended up in landfills. This is analogous to stacking enough refrigerators a fifth of the way to the moon or placing them end to end around the equator of the Earth twice.

Cost Impact: This proposal will increase the cost of construction

Staff note: This proposal is one of several proposals adding a new appendix L. The intention of the proponent has been indicated that the contents of the proposals be combined if they should be approved into a single Appendix L Titled "Appendix L, Building Resilience."

G252-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX L (NEW) #1-G-SKALKO-THOMPSON.doc

G253 – 12
APPENDIX L (NEW)

Proponent: Stephen V. Skalko Portland Cement Association and Jason Thompson National Concrete Masonry Association representing the Masonry Alliance for Codes and Standards

Add new text as follows:

APPENDIX L
BUILDING RESILIENCE

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION L101
GENERAL

L101.1 Purpose. The purpose of this appendix is to promote enhanced public health, safety and general welfare and to reduce public and private property losses due to hazards and natural disasters associated with fires, flooding, high winds and earthquakes.

SECTION L102
OCCUPANCY SEPARATION

L102.1 General. Occupancy separation in b*uildings* shall comply with Section L102.2.

L102.2 Mixed Use and Occupancy. All buildings containing mixed occupancies shall be in accordance with this section.

L102.2.1 Separation of incidental accessory occupancies. The incidental accessory occupancies listed in Table L102.2.1 shall be separated from the remainder of the *building* by fire barriers.

TABLE L102.2.1
INCIDENTAL ACCESSORY OCCUPANCIES[a]

Room or Area	Separation and/or Protection
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1-hour and provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower.	1-hour and provide automatic sprinkler system
Refrigerant machinery rooms	1-hour and provide automatic sprinkler system
Parking garage (Section 406.2 of the Code, *Parking garages*)	2-hour and provide automatic sprinkler system
Hydrogen cut off rooms	2-hour and provide automatic sprinkler system
Incinerator rooms	2-hour and provide automatic sprinkler system
Laundry rooms over 100 square feet	1-hour and provide automatic sprinkler system
Storage rooms over 100 square feet	1-hour and provide automatic sprinkler system
Waste and linen collection rooms other than rooms designated for the collection of recyclables	1-hour and provide automatic sprinkler system

Rooms designated for the collection of recyclables	2-hour and provide automatic sprinkler system
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons, or lithium ion capacity of 1,000 pounds used for facility standby power, emergency power or uninterrupted power supplies	2-hour and provide automatic sprinkler system
Rooms in non-high-rise buildings containing fire pumps	2-hour and provide automatic sprinkler system
Rooms in high-rise buildings containing fire pumps	2-hour and provide automatic sprinkler system
[a] The requirements in this table take precedence over Table 508.2.5, *Incidental accessory occupancies* of the *International Building Code*.	

L102.2.2 Separation of mixed occupancies. All occupancies except incidental accessory occupancies in Table L102.2.1 shall be separated from each other by fire barriers in accordance with Table L102.2.2

TABLE L102.2.2
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Occupancy	A[d]	E	B	I	F-2, S-2[b,c], U[b]	F-1, S-1, M	H-1	H-2	H-3, H-4, H-5
A[d]	N	2	2	2	1	2	NP	4	3
E[d]	—	N	2	2	1	2	NP	4	3
B	—	—	N	2	1	2	NP	3	2
I	—	—	—	N	2	2	NP	NP	NP
F-2, S-2[b,c], U[c]	—	—	—	—	N	2	NP	4	3[a]
F-1, S-1, M	—	—	—	—	—	N	NP	3	2[a]
H-1	—	—	—	—	—	—	N	NP	NP
H-2	—	—	—	—	—	—	—	N	1
H-3, H-4, H-5	—	—	—	—	—	—	—	—	N

N = No separation requirement.
NP = Not permitted.
a. For Group H-5 occupancies, see Section 903.2.5.2 of the *International Building Code*.
b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
c. See Section 406.3.4 of the *International Building Code*.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

SECTION L103
FIRE PROTECTION FEATURES

L103.1General. *Building* fire protection features shall comply with Sections L103.2 through L103.12.

L103.2 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of the building shall not exceed the percentages specified in Table L103.2.

L103.3 Protected Openings. The exception for opening protectives in Section 705.8.2 of the *International Building Code*, shall not be permitted.

L103.4 Vertical Separation of Openings. Exception 2 of Section 705.8.5 shall not be permitted.

L103.5 Parapets. Exception 5 of Section 705.11 shall not be permitted for Group R-2 occupancies.

L103.6 Fire Walls. Fire walls shall meet the requirements of this section.

L103.6.1 Materials. Fire walls for all types of construction shall be of any approved noncombustible material permitted in NFPA 221.

L103.6.2 Fire Resistance Rating. The fire-resistance ratings shall meet or exceed the ratings provided in Table L103.6.2.

L103.6.3 Horizontal continuity. Exception 3 of Section 706.5 shall not be permitted.

L103.6.4 Openings. Exception 2 of Section 706.8 shall not be permitted.

L103.7 Fire Barriers. Fire barriers shall comply with the provisions of this section.

L103.7.1 Fire-resistance. The fire resistance rating the separation between individual dwelling units and sleeping units, and between dwelling units and sleeping units and other spaces in the building shall be fire barriers having a minimum 2-hour fire-resistance rated construction as required in Table 707.3.10,

L103.7.2 Openings. Exception 1 in Section 707.6 of the *International Building Code* that allows openings in a fire barrier to be larger than 156 sq.ft. where *automatic sprinkler systems* are provided shall not be permitted.

L103.8 Shaft Enclosures. Exception 5 of Section 713.14.1 shall not be permitted.

L103.9 Fire Partitions. Fire partitions shall comply with the provisions of this section.

L103.9.1 Dwelling unit separation. Fire partitions in Section 708.1 shall not be permitted for walls separating dwelling units in the same building.

L103.9.2 Sleeping unit separation. Fire partitions in Section 708.1 shall not be permitted for walls separating sleeping units in the same building.

L103.9.3 Corridor walls. Fire partitions in Section 708.1 shall not be permitted for corridor walls separating corridors from dwelling units or sleeping units in the same building.

L103.9.4 Continuity. Exception 6 in Section 708.4 shall not be permitted.

L103.10 Horizontal Assemblies. Horizontal assemblies shall comply with the requirements of this section.

L103.10.1 Dwelling and sleeping units. Minimum 2-hour fire resistance rated horizontal assemblies shall be required to separate dwelling units in the same building and separate sleeping units in occupancies in the same building as required in Table 707.3.10,

L103.10.2 Fire resistance rating. The exception to Section 711.3 shall not be permitted.

L103.11 Opening Protectives. The provisions of this section shall apply to opening protectives.

L103.11.1 Doors in interior exit stairways and ramps and exit passageways. The Exception to Section 716.5.5 shall not be permitted.

L103.11.2 Glazing in doors. The Exception to Section 716.5.5.1 shall not be permitted.

L103.12 Concealed Spaces. Exceptions 1 and 2 of Section 718.3.2 shall not be permitted for Groups R-1, R-2 or R-4 occupancies.

TABLE L103.2
MAXIMUM AREA OF EXTERIOR WALL OPENING BASED ON
FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION[a]

Fire Separation Distance (feet)	Degree of Opening Protection	Allowable Areas[b]
0 to less than 3[c,d]	Unprotected (UP)	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5[e]	Unprotected (UP)	Not Permitted
	Protected (P)	15%
5 to less than 10[g]	Unprotected (UP)	10%
	Protected (P)	25%
10 to less than 15[f,g]	Unprotected (UP)	15%
	Protected (P)	45%
15 to less than 20[f,g]	Unprotected (UP)	25%
	Protected (P)	75%
20 to less than 25[f,g]	Unprotected (UP)	45%
	Protected (P)	No Limit
25 to less than 30[f,g]	Unprotected (UP)	70%
	Protected (P)	No Limit
30 or greater	Unprotected (UP)	No Limit
	Protected (P)	Not Required

For SI: 1 foot = 304.8 mm
UP = Unprotected openings in buildings
P = Openings protected with an opening protective assembly in accordance with section 705.8.2 the

a. The requirements in this table take precedence over Table 705.8 of the Code.
b. Values indicated are the percentage of the area of the exterior wall per story.
c. For the requirements for fire walls of buildings with differing heights see Section 706.6.1
d. For openings in a fire wall for building son the same lot, see Section 705.8
e. The maximum percentage of unprotected and protected openings shall be 25% for Group R-3 occupancies.
f. The area of unprotected and protected openings shall not be limited for Group R-3 occupancies with a fire separation distance of 5 feet or greater.
g. Includes buildings accessory to Group R-3.

TABLE L103.6.2
FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, U	3
F-1, H-3[a], H-5, M, S-1	3
H-1, H-2	4[a]
F-2, S-2, R-3, R-4	2

a. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

Reason: This reason statement has the following two segments to explain the reasons for this change: (A) The code change is explained with specific substantiation; and (B) General background information identifying the need for enhanced property protection and functional resilience for to strengthen the built environment;

(A) The following are reports of dollar loss to property from wind, cold weather and fire disasters.

- The American Society of Civil Engineers reported in *Normalized Hurricane Damage in the United States*, *1900 – 2005,* National Hazard Review, ASCE 2008, that property damage from hurricanes was 81 billion dollars in 2005.

- The National Weather Service reports that U.S. property damage due to winter storms and ice exceeded 1.5 billion dollars in 2009.
- *Fire Losses in the United States During 2009* by the National Fire Protection Association, August 2010 shows that property loss due to structure fires in buildings other than one and two family dwellings was approximately 4.5 billion dollars.

Increasing the stringency of the design criteria of buildings for hazards such as wind, snow or fire results in more robust buildings. Such requirements reduce the amount of energy and resources required for repair, removal, disposal and replacement of building components and systems damaged from these disasters. A further benefit is a reduction in the amount of damaged building materials and content entering landfills.

Additional benefits are enhanced life safety, security and occupant comfort; potentially less demand on community resources required for emergency response; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future.

(B) Minimum building requirements whether through energy codes, plumbing codes, mechanical codes, zoning codes, or basic building codes, do not encourage truly sustainable buildings. This proposal is one of several that attempt to integrate the concepts of the *Whole Building Design Guide* (WBDG) into the International Building Code as a non-mandatory Appendix. This allows adopting jurisdictions the option of incorporating code requirements into the building code to improve the resilience of the built environment without the need to add another code to the community requirements.

The WBDG, developed in partnership between the National Institute of Building Sciences (NIBS) and the Sustainable Building Industries Council (SBIC), has as its key concepts: accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable.

There are numerous references about the economic, societal, and environmental benefits that result when enhanced functional resilience for resource minimization are integrated into building design and construction. Six examples demonstrating the importance and supporting the concepts are:

1. ***Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities***
   National Institute of Building Sciences Multi-Hazard Mitigation Council - 2005
   One of the findings in this report is "The analysis of the statistically representative sample of FEMA grants awarded during the study period indicates that a dollar spent on disaster mitigation saves society an average of $4." The programs studied often addressed issues and strategies other than enhanced disaster resistance of buildings and other structures. However, more disaster-resistant buildings enhance life safety; reduce costs and environmental impacts associated with repair, removal, disposal, and replacement; and reduce the time and resources required for community recovery.
2. ***Five Years Later – Are we better prepared?***
   Institute for Business and Home Safety - 2010
   This IBHS report states: "When Hurricane Katrina made landfall on Aug. 29, 2005, it caused an estimated $41.1 billion in insured losses across six states, and took an incalculable economic and social toll on many communities. Five years later, the recovery continues and some residents in the most severely affected states of Alabama, Louisiana and Mississippi are still struggling. There is no question that no one wants a repeat performance of this devastating event that left at least 1,300 people dead. Yet, the steps taken to improve the quality of the building stock, whether through rebuilding or new construction, call into question the commitment of some key stakeholders to ensuring that past mistakes are not repeated." This report indicates that there is a need to implement provisions to make buildings more disaster-resistant. Clearly this suggests that functional resilience should at least be integrated into the design and construction of sustainable buildings.
3. **National Weather Service Office of Climate, Water and Weather Services**
   National Oceanic and Atmospheric Administration (NOAA) - 2010
   Data provided on the NOAA website [www.weather.gov/os/hazstats.shtml] indicates that the average annual direct property loss due to natural disasters in the United States exceeds of $35,000,000,000. This does not include indirect costs associated with loss of residences, business closures, and resources expended for emergency response and management. These direct property losses also do not reflect the direct environmental impact due to reconstruction after the disasters. Functional resilience will help alleviate the environmental impact and minimize both direct and indirect losses from natural disasters.
4. ***Global Climate Change Impacts in the United States***
   U.S. Global Change Research Program (USGCRP) - 2009
   The USGCRP includes the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation; National Aeronautic and Space Administration; Environmental Protection Agency, USA International Development, National Science Foundation and Smithsonian Institution
   The report identifies that: "Climate changes are underway in the United States and are projected to grow. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow." The report further identifies that the: "Threats to human health will increase. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts." Key messages in the report on societal impacts include:
   - "City residents and city infrastructure have unique vulnerabilities to climate change. "

- "Climate change affects communities through changes in climate-sensitive resources that occur both locally and at great distances."
- "Insurance is one of the industries particularly vulnerable to increasing extreme weather events such as severe storms, but it can also help society manage the risks."

Sustainable building design and construction cannot be about protecting the natural environment without consideration of the projected growth in severe weather. Minimum codes primarily based on past natural events are not appropriate for truly sustainable buildings. Buildings expected to have long term positive impacts on the environment must be protected from these extreme changes in the natural environment. The provisions for improved property protections are necessary to reduce the amount of energy and resources associated with repair, removal, disposal, and replacement due to routine maintenance and damage from disasters. Further such provisions reduce the time and resources required for community disaster recovery.

5. ***Sustainable Stewardship -*** *Historic preservation plays an essential role in fighting climate change ,*
   Traditional Building, National Trust for Historic Preservation - 2008

   In the article Richard Moe summarizes the results of a study by the Brookings Institution which projects that by 2030 we will have demolished and replaced 82 billion square feet of our current building stock, or nearly 1/3 of our existing buildings, largely because the vast majority of them weren't designed and built to last any longer. Durability, as a component of functional resilience, can reduce these losses.

6. **Opportunities for Integrating Disaster Mitigation and Energy Retrofit Programs**

   Senate Environment and Public Works Committee Room, Dirksen Senate Office Building, Washington, D.C. - 2010

   During this panel discussion a representative of the National Conference of State Historic Preservation Officers noted that more robust buildings erected prior to 1950 tend to be more adaptable for reuse and renovation. Prior to the mid-1950s most local jurisdictions developed their own building code requirements that uniquely addressed the community's needs, issues and concerns. Pre-1950 building codes typically resulted in more durable and robust construction that lasts longer.

The total environmental impact of insulation, high efficiency equipment, components, and appliances, low-flow plumbing fixtures, and other building materials and contents are relatively insignificant when rendered irreparable or contaminated and must be disposed of in landfills after disasters. The US Army Corps of Engineers estimated that after Hurricane Katrina nearly 1.2 billion cubic feet of building materials and contents ended up in landfills. This is analogous to stacking enough refrigerators a fifth of the way to the moon or placing them end to end around the equator of the Earth twice.

Cost Impact: This proposal will increase the cost of construction

Staff note: This proposal is one of several proposals adding a new appendix L. The intention of the proponent has been indicated that the contents of the proposals be combined if they should be approved into a single Appendix L Titled "Appendix L, Building Resilience."

G253-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX L (NEW) #2-G-SKALKO-THOMPSON.doc

G254 – 12
Appendix N (NEW)

Proponent: Barry Greive, Target Corporation (barry.greive@Target.com)

Add new text as follows:

APPENDIX N
REPLICABLE BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION N101
GENERAL

N101.1 Scope. The purpose of this appendix shall establish the minimum requirements for a replicable building review and approval process.

N101.2 Design. Buildings and facilities shall be designed and constructed in accordance with all applicable provisions of this code and referenced standards.

SECTION N102
DEFINITIONS

N102.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein.

QUALIFIED AGENCY. A qualified individual, company, or jurisdiction approved by the code official.

REPLICABLE BUILDINGS. A building whose construction plans have been reviewed and deemed code compliant by an *approved* designated third party.

REPLICABLE BUILDING DESIGN. A proposed design, whether it be a new building or remodel, that is based on a given prototype to be built it in a variety of locations but that maintains consistent overall design parameters.

SECTION N103
SCOPING REQUIREMENTS

N103.1. General Design Requirements. A *replicable building* shall be based on a prototype design and several building elements that must be considered.

1. The building shall have the same use, occupancy, construction type, fire resistance, fire protection system, means of egress, and accessibility regardless of location.
2. The building form shall be consistent height and square footage with variations complying with Section N103.2
3. The building shall incorporate the same general *approved* structural design and address various regional conditions such as wind, hurricane, snow, and seismic loads.
4. The building shall have consistent basic mechanical, electrical and plumbing systems.
5. The building shall include *approved* options for various exterior of finish materials, veneers and details based on regional architectural styles. Changes to the façade shall have no impact on the operation, function or life safety requirement of the building.
6. Where the interior décor is different, the same materials, or materials of the same Class in accordance with their flame spread and smoke-developed indexes shall be used.

7. The building plans shall be reviewed and *approved* within the context of the site and other applicable, locally adopted development regulations and standards.

N103.2 Allowable Variations to the Replicable Design. The following are allowable variations to a *replicable building design*.

1. Reductions to the design height or square footage that have no impact on egress requirements.
2. Increases of no more than 5 percent to the design height or square footage to accommodate local requirements such as planning/zoning, development agreements and design image issues.
3. Modifications to the building envelope and mechanical, electrical and plumbing systems to accommodate local conditions and requirements, such as energy efficiency, ventilation, climate and local codes.

SECTION N104
REPLICABLE BUILDING REVIEW

N104.1 General. *Replicable buildings* shall be reviewed by an approved third party agency or the local jurisdiction.

N104.2. Qualified Agency Requirements. When using a third party agency or other qualified individuals the desired level of expertise provided for the review shall be approved by the code official and in accordance with one or more of the following.

1. Any *qualified agency* involved in the review shall be certified by *International Code Council* or equivalent organization for every code discipline reviewed.
2. Acceptable professional individuals, including but not limited to registered engineers or licensed architects shall have a minimum number of years of experience as determined by the jurisdiction.
3. A peer review process shall be in place requiring a registered design professional or certified building official to provide oversight of the final replicable review.
4. A uniform checklist similar to the ICC plan review records shall be used to maintain consistency in the review process.

Reason: August 2010 the International Code Council published a document titled the "IGG G1-2010 Guideline for Replicable Buildings". The intent of this guideline is to give jurisdictions a tool that they could adopt to help streamline their document review process to ensure code compliance. This code change proposal adds it to an Appendix chapter so jurisdictions have an easy way of adding this concept into their building code adoption process. The intent is to streamline the plan review process at the local level allowing the plan reviewer to focus on any state and local amendments to the International Family of Codes.

Bibliography: ICC G1 – 2010 Guideline for Replicable Buildings

Cost Impact: The code change proposal will not increase the cost of construction.

G254-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX N (NEW)-G-GRIEVE

G255 – 12
Appendix N (NEW)

Proponent: Dru Meadows, theGreenTeam, Inc., representing Wal-Mart Stores, Inc. (dmeadows@thegreenteaminc.com)

Add new text as follows:

APPENDIX N
REPLICABLE BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION N101
GENERAL

N101.1 Scope. The provisions of this appendix shall apply to *replicable design* for new buildings and structures and for the alteration, repair, and addition of existing buildings and structures.

SECTION N102
DEFINITIONS

N102.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein.

APPROVED AGENCY. An independent person, firm or corporation, or other agency or organization, acceptable to the building official or authority having jurisdiction.

REPLICABLE BUILDING. Building or structure utilizing a *replicable design*.

REPLICABLE DESIGN. A prototypical design developed for application in multiple locations with minimal variation or modification.

SECTION N103
REPLICABLE DESIGN REQUIREMENTS

N103.1 Prototypical construction documents. A *replicable design* shall establish prototypical construction documents for application at multiple locations. The construction documents shall include details appropriate to each wind region, seismic design category, and climate zone for locations in which the *replicable design* is intended for application. Application of *replicable design* shall not vary with regard to the following, except for allowable variations in accordance with Section N106.1.1.

1. Use and occupancy classification
2. Building height and area limitations
3. Type of construction classification
4. Fire resistance ratings
5. Interior finishes
6. Fire protection system
7. Means of egress
8. Accessibility
9. Structural design criteria
10. Energy efficiency
11. Type of mechanical and electrical systems
12. Type of plumbing system and number of fixtures

SECTION N104
REPLICABLE DESIGN SUBMITTAL REQUIREMENTS

N104.1 General. A summary description of the *replicable design* and related construction documents shall be submitted. Where approval is requested for elements of the *replicable design* not within the scope of the *International Building Code*, the construction documents shall specifically designate the codes for which review is sought. Construction documents shall be signed, sealed and dated by the registered design professional.

N104.1.1 Architectural plans and specifications. Where approval of the architectural requirements of the *replicable design* is sought, the submittal documents shall include architectural plans and specifications as follows:

1. Description of uses and the proposed occupancy groups for all portions of the building.
2. Proposed type of construction of the building.
3. Fully dimensioned drawings to determine building areas and height.
4. Adequate details and dimensions to evaluate means of egress, including occupant loads for each floor, exit arrangement and sizes, corridors, doors, stairs.
5. Exit signs and means of egress lighting, including power supply.
6. Accessibility scoping provisions.
7. Description and details of proposed special occupancies such as a covered mall, high-rise, mezzanine, atrium, and public garage.
8. Adequate details to evaluate fire resistive construction requirements, including data substantiating required ratings.
9. Details of plastic, insulation, and safety glazing installation.
10. Details of required fire protection systems.

N104.1.2 Structural plans, specifications, and engineering details. Where approval of the structural requirements of the *replicable design* is sought, the submittal documents shall include details for each wind region, seismic design category and climate zone for which approval is sought; and, shall include the following:

1. Signed and sealed structural design calculations which support the member sizes on the drawings.
2. Design load criteria, including: frost depth; live loads; snow loads; wind loads; earthquake design data; other special loads.
3. Details of foundations and superstructure.
4. Provisions for required special inspections.
5. Material specifications demonstrating fire resistance criteria.

N104.1.3 Energy conservation details. Where approval of the energy conservation requirements of the *replicable design* is sought, the submittal documents shall include details for each climate zone for which approval is sought; and, shall include the following:

1. Climate zones for which approval is sought.
2. Building envelope details.
3. Building mechanical systems details.
4. Details of electrical power and lighting systems.
5. Provisions for system commissioning.

SECTION N105
REVIEW AND APPROVAL OF REPLICABLE DESIGN

N105.1 General. Proposed *replicable design* shall be reviewed by an *approved agency*. The review shall be applicable only to the *replicable design* features submitted in accordance with Section N104.

The review shall determine compliance with this code and additional codes specified under Section N104.1.

N105.2 Documentation. The results of the review shall be documented indicating compliance with the code requirements.

N105.3 Deficiencies. Where the review of the submitted construction documents identifies elements where the design is deficient and will not comply with the applicable code requirements, the *approved agency* shall notify the proponent of the *replicable design*, in writing, of the specific areas of non-compliance and request correction.

N105.4 Approval. Where the review of the submitted construction documents determines that the design is in compliance with the codes designated in Section N104.1, and where deficiencies identified in Section N105.3 have been corrected, the *approved agency* shall issue a Summary Report of Approved Replicable Design. The Summary Report shall include a reference to the specific plans approved and shall include any limitations on the approved *replicable design* including, but not limited to climate zones, wind regions and seismic design categories.

SECTION N106
SITE SPECIFIC APPLICATION OF APPROVED REPLICABLE DESIGN

N106.1 General. Where site specific application of a *replicable design* which has been approved under the provisions of Section N105 is sought, the construction documents submitted to the jurisdiction shall comply with this section.

N106.1.1 Allowable Variations. Where an approved *replicable design* is proposed for use in a specific location, variations to the approved design shall be limited to the following:

1. Reductions in the building height that do not impact compliance with the means of egress requirements.
2. Reductions in the building area that do not impact compliance with the means of egress requirements.
3. Increases to height that do not exceed 5 percent of the approved replicable design or that are necessary to comply with local requirements.
4. Increases to area that do not exceed 5 percent of the approved replicable design or that are necessary to comply with local requirements.
5. Modifications to the exterior walls, roof assemblies, mechanical, electrical, or plumbing to accommodate local conditions such as climate and energy requirements of the jurisdiction.
6. Modifications *to interior finishes* which are of the same classification, or better, than those provided in the approved *replicable design.*
7. Modifications to the exterior walls which are of the same classification, or higher, than those provided in the approved *replicable design*.
8. Modifications to mechanical, electrical, or plumbing systems that increase efficiency and that do not alter type of system or fixture count.
9. Modifications as approved by the building official.

N106.2 Submittal Documents. A summary description of the *replicable design* and related construction documents shall be submitted. Construction documents shall be signed, sealed and dated by the registered design professional. Construction documents shall identify allowable variations to the *replicable design* reviewed by the *approved agency*. A statement, signed, sealed and dated by the registered design professional, that the *replicable design* submitted for local review is the same as the *replicable design* reviewed by the *approved agency* shall be submitted.

N106.2.1 Architectural plans and specifications. Architectural plans and specifications shall include the following:

1. Construction documents for variations from the *replicable design*.
2. Construction documents for portions of the building that are not part of the *replicable design*.
3. Documents for local requirements as identified by the building official.

N106.2.2 Structural plans, specifications, and engineering details. Structural plans, specifications, and engineering details shall include the following:

1. Construction documents for variations from the *replicable design*.
2. Construction documents for portions of the building that are not part of the *replicable design*.
3. Documents for local requirements as identified by the building official.
4. Soils report indicating the soil type and recommended allowable bearing pressure and foundation type.

N106.2.3 Site plans. Site plans shall include the following:

1. Size and location of all new construction and all existing structures on the site.
2. Distances from lot lines and existing buildings or structures.
3. Established street grades and proposed finish grades.

SECTION N107
SITE SPECIFIC REVIEW AND APPROVAL OF REPLICABLE DESIGN

N107.1 General. Proposed site specific application of *replicable design* shall be submitted for permit in accordance with the provisions of Chapter 1 and Appendix N.

N107.2 Site specific review and approval of *replicable design*. The building official shall verify that the *replicable design* submitted for site specific application is the same as the approved *replicable design* reviewed by the *approved agency*. In addition, the building official shall review the following for code compliance:

1. Variations, other than allowable variations, from *replicable design*.
2. Portions of the building that are not part of the *replicable design*.
3. Local requirements as identified by the building official.

Reason: This proposed code change is intended to provide the specific requirements for replicable building review, consistent with the ICC GI-2010 Guideline for Replicable Buildings. Replicable buildings use a prototypical design developed for application in multiple locations with minimal variation or modification.

ICC GI-2010 was developed to “help state and local jurisdictions—as well as owners, architects, builders and engineers—to streamline a building document review process to examine and verify replicable construction documents; thus eliminating repetitive code compliance reviews.”

The ICC guideline outlines the principles of a centralized or “global” review for prototypical design elements. However, it does not provide specific requirements.

This addition is needed to provide specific requirements. This addition will expand on the objectives of the ICC guideline.

- It responds to changing technology and capabilities. As owners, architects, builders and engineers continue to utilize technology and systems to increase their efficiencies, regulatory efficiency must also continue to advance.
- It promotes efficiency. A centralized review of prototypical design elements can save considerable state and local resources and time by eliminating repetitive code-compliance reviews. Local jurisdictions can then utilize their resources to focus on reviews of complex and high-risk projects.
- It supports quality control. By coupling centralized review of prototypical design elements with a local review of unique jurisdictional requirements, replicable buildings that utilize this process can be constructed with greater consistency.

Bibliography: ICC GI-2010 Guideline for Replicable Buildings

Cost Impact: The code change proposal will not increase the cost of construction.

G255-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX X (NEW)-G-MEADOWS.doc

2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – MEANS OF EGRESS

MEANS OF EGRESS CODE COMMITTEE

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ICC Indiana Field Office
Carmel, IN

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

MEANS OF EGRESS

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

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

E96-12: NUMBER NOT USED

- E1-12
  - G57-12
  - G68-12
- E2-12
- E3-12
  - G85-12
- E4-12
  - G52-12
- E5-12
  - G9-12
  - G51-12
- E6-12
- E9-12
- E10-12
- E11-12
- E12-12
- E13-12
- E16-12
- E17-12
  - E15-12
  - E14-12
- E18-12
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202, 1006 (New), 1007 (New), 1014.3, 1015, 1020.1, 1021 (IFC [B] 1006 (New), 1007 (New), 1014.3, 1015, 1020.1, 1021)

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

SECTION 202
DEFINITIONS

COMMON PATH OF EGRESS TRAVEL. That portion of the exit access travel distance measured from the most remote point within a story to that point where ~~which~~ the occupants ~~are required to traverse before two~~ have separate and distinct ~~paths of egress travel~~ access to two exits or exit access doorways ~~are available. Paths that merge are common paths of travel. Common paths of egress travel shall be included within the permitted travel distance.~~

Revise as follows:

~~**1014.3 (IFC [B] 1014.3) Common path of egress travel.** The common path of egress travel shall not exceed the common path of egress travel distances in Table 1014.3.~~

~~**TABLE 1014.3 (TABLE [B] 1014.3)**~~
~~**COMMON PATH OF EGRESS TRAVEL**~~

~~**OCCUPANCY**~~	~~**WITHOUT SPRINKLER SYSTEM (feet)**~~		~~**WITH SPRINKLER SYSTEM (feet)**~~
	~~**Occupant Load**~~		
	~~**OL ≤ 30**~~	~~**OL > 30**~~	
~~B, S[d]~~	~~100~~	~~75~~	~~100[a]~~
~~U~~	~~100~~	~~75~~	~~75[a]~~
~~F~~	~~75~~	~~75~~	~~100[a]~~
~~H-1, H-2, H-3~~	~~Not Permitted~~	~~Not Permitted~~	~~25[a]~~
~~R-2~~	~~75~~	~~75~~	~~125[b]~~
~~R-3[e]~~	~~75~~	~~75~~	~~125[b]~~
~~I-3~~	~~100~~	~~100~~	~~100[a]~~
~~All others[c]~~	~~75~~	~~75~~	~~75[a,b]~~

~~For SI: 1 foot = 304.8 mm.~~

~~a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.~~
~~b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.~~
~~c. For a room or space used for assembly purposes having fixed seating, see Section 1028.8.~~
~~d. The length of a common path of egress travel in a Group S-2 open parking garage shall not be more than 100 feet (30 480 mm)~~
~~e. The length of a common path of egress travel in a Group R-3 occupancy located in a mixed occupancy building.~~
~~f. For the distance limitations in Group I-2, see Section 407.4.~~

SECTION ~~1015~~ 1006 (IFC [B] ~~1015~~ 1006)
NUMBERS OF EXITS AND EXIT ACCESS DOORWAYS

~~1015.1~~ 1006.1 (IFC [B] ~~1015.1~~ 1006.1) General ~~Exits or exit access doorways from spaces.~~ The number of exits or exit access doorways required within the means of egress system shall comply with the provisions of Section 1006.2 for spaces and Section 1006.3 for stories. ~~Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:~~

~~1. The *occupant load* of the space exceeds one of the values in Table 1015.1.~~

~~**Exceptions:**~~

1. ~~In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.~~
2. ~~Care suites in Group I-2 occupancies complying with Section 407.4.3.~~

2. ~~The *common path of egress travel* exceeds one of the limitations of Section 1014.3.~~
3. ~~Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.~~

~~Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.~~

~~**TABLE 1015.1 (IFC [B] TABLE 1015.1)**~~
~~**SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**~~

~~OCCUPANCY~~	~~MAXIMUM OCCUPANT LOAD~~
~~A, B, E, F, M, U~~	~~49~~
~~H-1, H-2, H-3~~	~~3~~
~~H-4, H-5, I-1, I-2, I-3, I-4, R~~	~~10~~
~~S~~	~~29~~

1006.2 (IFC [B] 1006.2) Egress from spaces. Rooms, areas or spaces, including mezzanines, within a story or basement shall be provided with the number of exits or access to exits in accordance with this section.

1006.2.1 (IFC [B] 1006.2.1) Egress based on occupant load and common path of egress travel distance. Two exits or exit access doorways from any space shall be provided where the design occupant load or the common path of egress travel distance exceeds the values listed in Table 1006.2.1.

Exceptions:

1. In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and the common path of egress travel does not exceed 125 feet (38 100 mm).
2. Care suites in Group I-2 occupancies complying with Section 407.4.

TABLE 1006.2.1 (IFC [B] 1006.2.1)
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM
		Occupant Load		
		OL ≤ 30	OL > 30	
A[a], E, M, U	49	75	75	75[b]
B	49	100	75	100[b]
F	49	75	75	100[b]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5, I-1, I-2, I-4, R-1, R-3,	10	NP	NP	75[b]

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM
		Occupant Load		
		OL ≤ 30	OL > 30	
R-4				
I-3	10	NP	NP	100[b]
R-2	10	NP	NP	125[c]
R-3	10	NP	NP	125[d]
S	29	100	75[e]	100[b]
U	49	100	75	75[b]

For SI: 1 foot = 304.8 mm.
NP – Not Permitted

a. For a room or space used for assembly purposes having fixed seating, see Section 1028.8.
b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
d. The length of common path of egress travel distance in a Group R-3 occupancy located in a mixed occupancy building shall be not more than 125 feet (38 100 mm).
e. The length of common path of egress travel distance in a Group S-2 open parking garage shall be not more than 100 feet (30 480 mm).

~~1015.1.1~~ 1006.2.1.1 (IFC [B] ~~1015.1.1~~ 1006.2.1.1) Three or more exits or exit access doorways. Three exits or exit access doorways shall be provided from any space with an occupant load of 501-1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

~~1015.2 (IFC [B] 1015.2) Exit or exit access doorway arrangement.~~ *(relocated to new Section 1007)*

~~1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways.~~ *(relocated to new Section 1007)*

~~1015.2.2 (IFC [B] 1015.2.2) Three or more exits or exit access doorways.~~ *(relocated to new Section 1007)*

1006.2.2 (IFC [B] 1006.2.2) Egress based on use. The numbers of exits or access to exits shall be in accordance with this section.

~~1015.3~~ 1006.2.2.1 (IFC [B] ~~1015.3~~ 1006.2.2.1) Boiler, incinerator and furnace rooms. Two *exit access doorways* are required in boiler, incinerator and furnace rooms where the area is over 500 square feet (46 m^2) and any fuel-fired equipment exceeds 400,000 British thermal units (Btu) (422 000 KJ) input capacity. Where two *exit access doorways* are required, one is permitted to be a fixed ladder or an *alternating tread device*. *Exit access doorways* shall be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room.

~~1015.4~~ 1006.2.2.2 (IFC [B] ~~1015.4~~ 1006.2.2.2) Refrigeration machinery rooms. Machinery rooms larger than 1,000 square feet (93 m^2) shall have not less than two *exits* or *exit access* doors. Where two *exit access doorways* are required, one such doorway is permitted to be served by a fixed ladder or an *alternating tread device*. *Exit access doorways* shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway*. An increase in travel distance is permitted in accordance with Section 1016.1.

Doors shall swing in the direction of egress travel, regardless of the *occupant load* served. Doors shall be tight fitting and self-closing.

~~**1015.5**~~ **1006.2.2.3 (IFC [B]** ~~**1015.5**~~ **1006.2.2.3) Refrigerated rooms or spaces.** Rooms or spaces having a floor area larger than 1,000 square feet (93 m^2), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two *exits* or *exit access* doors.

Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an *exit* or *exit access* door where such rooms are not protected by an *approved automatic sprinkler* system. Egress is allowed through adjoining refrigerated rooms or spaces.

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *International Mechanical Code*.

~~**1015.6**~~ **1006.2.2.4 (IFC [B]** ~~**1015.6**~~ **1006.2.2.4) Day care facilities.** Day care facilities, rooms or spaces where care is provided for more than 10 children that are 2-1/2 years of age or less, shall have access to not less than two exits or exit access doorways.

~~**SECTION 1021 (IFC [B] 1021)**~~
~~**NUMBER OF EXITS AND EXIT CONFIGURATION**~~

~~**1021.3.1 (IFC [B]1021.3.1)**~~ **1006.3 (IFC [B] 1006.3)** ~~**Access to exits at adjacent levels.**~~ **Egress from stories or occupied roofs** The means of egress system serving any story or occupied roof shall be provided with the number of exits or access to exits based on the aggregate occupant load served in accordance with this section. Access to exits at other levels shall be by stairways or ramps. Where access to exits occurs from adjacent building levels, the horizontal and vertical exit access travel distance to the closest exit shall not exceed that specified in Section 1016.1. Access to exits at other levels shall be from an adjacent story.

Each story above the second story of a building shall have a minimum of one interior or exterior exit stairway, or interior or exterior exit ramp. Where a minimum of three or more exits, or access to exits are required, a minimum of 50 percent of the required exits shall be interior or exterior exit stairways or ramps.

~~**Exception:** Landing platforms or roof areas for helistops that are less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m^2) in area, shall be permitted to access the second exit by a fire escape, alternating tread device or ladder leading to the story or level below.~~

Exceptions:

1. Interior exit stairways and interior exit ramps are not required in open parking garages where the means of egress serves only the open parking garage.
2. Interior exit stairways and interior exit ramps are not required in outdoor facilities where all portions of the means of egress are essentially open to the outside.

~~**1021.1 (IFC [B] 1021.10)**~~ **1006.3.1 (IFC [B] 1006.3.1)** ~~**General.**~~**Egress based on occupant load.** Each story and occupied roof shall have the minimum number of exits, or access to exits, as specified in Table 1006.3.1 ~~this section~~. A single exit or access to a single exit shall be permitted in accordance with Section 1006.3.3. The required number of exits, or exit access stairways or ramps providing access to exits, from any story shall be maintained until arrival at the exit discharge ~~grade~~ or ~~a~~ public way. ~~Exits or access to exits from any story shall be configured in accordance with this section. Each story above the second story of a building shall have a minimum of one interior or exterior exit stairway, or interior or exterior exit ramp. At each story above the second story that requires a minimum of three or more exits, or access to exits, a minimum of 50 percent of the required exits shall be interior or exterior exit stairways, or interior or exterior exit ramps.~~

~~**Exceptions:**~~

~~1. Interior exit stairways and interior exit ramps are not required in open parking garages where the means of egress serves only the open parking garage.~~
~~2. Interior exit stairways and interior exit ramps are not required in outdoor facilities where all portions of the means of egress are essentially open to the outside.~~

TABLE 1006.3.1 (IFC [B] TABLE 1006.9.3.1)
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD PER STORY	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY
1-500	2
501-1,000	3
More than 1,000	4

~~**1021.2.4 (IFC [B] 1021.2.4) Three or more exits.** Three *exits*, or *exit access stairways* or *ramps* providing access to *exits* at other stories, shall be provided from any story or occupied roof with an *occupant load* from 501 to and including 1,000. Four *exits*, or *exit access stairways* or *ramps* providing access to *exits* at other stories, shall be provided from any story or occupied roof with an *occupant load* greater than 1,000.~~

~~1021.2.5~~ 1006.3.2 (IFC [B] ~~1021.2.5~~ 1006.3.2) Additional exits. In buildings over 420 feet in height, additional exits shall be provided in accordance with Section 403.5.2.

~~1021.2~~ 1006.3.3 (IFC [B] ~~1021.2~~ 1006.3.3) Single exits ~~Exits from stories.~~ ~~Two exits, or exit access stairways or ramps providing access to exits, from any story or occupied roof shall be provided~~ A single exit or access to a single exit shall be permitted from any story or occupied roof, where one of the following conditions exists:

1. The occupant load or number of dwelling units ~~exceeds one of~~ and common path of egress travel distance does not exceed the values in Table 1006.3.3(1) or 1006.3.3(2) ~~1021.2(1) or 1021.2(2).~~
2. ~~The exit access travel distance exceeds that specified in Table 1021.2(1) or 1021.2(2) as determined in accordance with the provisions of Section 1016.1.~~
3. ~~Helistop landing areas located on buildings or structures shall be provided with two exits, or exit access stairways or ramps providing access to exits.~~

~~**Exceptions:**~~

~~1~~2. Rooms, areas and spaces complying with Table 1006.2.1 ~~Section 1015.1~~ with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit.
~~2~~3. Group R-3 occupancy buildings shall be permitted to have one exit.
~~3~~4. Parking garages where vehicles are mechanically parked shall be permitted to have one exit or access to a single exit.
~~4~~5. Air traffic control towers shall be provided with the minimum number of exits specified in Section 412.3.
~~5. Individual dwelling units in compliance with Section 1021.2.3.~~
6. Group R-3 and R-4 congregate residences shall be permitted to have one exit.
~~7. Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:~~
   ~~7.1 The number of exits from the entire story complies with Section 1021.2.4;~~
   ~~7.2 The access to exits from each individual space in the story complies with Section 1015.1, and~~
   ~~7.3 All spaces within each portion of a story shall have access to the minimum number of approved independent exits based on the occupant load of that portion of the story, but not less than two exits.~~

~~1021.2.3 (IFC [B] 1021.2.3) Single-story or multi-story dwelling units.~~

7. Individual single-story or multi-story dwelling units shall be permitted to have a single exit or access to a single exit from the dwelling unit provided that all of the following criteria are met:
   - 7.1.~~1.~~ The dwelling unit complies with Section ~~1015.1~~ 1006.2.1 as a space with one means of egress and
   - 7.2.~~2.~~ Either the exit from the dwelling unit discharges directly to the exterior at the level of exit discharge, or the exit access outside the dwelling unit's entrance door provides access to not less than two approved independent exits.

~~TABLE 1021.2(1)~~ TABLE 1006.3.3(1) (IFC [B] ~~TABLE 1021.2(1)~~ TABLE 1006.3.3(1))
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM COMMON PATH OF EGRESS ~~EXIT ACCESS~~ TRAVEL DISTANCE (feet)
Basement, first, second or third story above grade plane	R-2[a, b]	4 dwelling units	125 ~~feet~~
Fourth story ~~and~~ above grade plane and higher	NP	NA	NA

For SI: 1 foot = 3048 mm.
NP – Not Permitted
NA – Not Applicable
a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
b. This table is used for Group R-2 occupancies consisting of dwelling units. For Group R-2 occupancies consisting of sleeping units, use Table 1006.3.3(2) ~~1021.2(2)~~..

~~TABLE 1021.2(2)~~ TABLE 1006.3.3(2) (IFC [B] ~~TABLE 1021.2(2)~~ TABLE 1006.3.3(2))
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANT~~S~~ LOAD PER STORY	MAXIMUM COMMON PATH OF EGRESS ~~EXIT ACCESS~~ TRAVEL DISTANCE (feet)
First story above or ~~basement~~ below grade plane	A, B[a], E F[a], M, U, S[a]	49 ~~occupants~~	75 ~~feet~~
	H-2, H-3	3 ~~occupants~~	25 ~~feet~~
	H-4, H-5, I, R-1, R-2[b,c], R-4	10 ~~occupants~~	75 ~~feet~~
	S	29 ~~occupants~~	100 ~~feet~~
Second story above grade plane	B, F, M, S	29 ~~occupants~~	75 ~~feet~~
Third story ~~and~~ above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP – Not Permitted
NA – Not Applicable
a. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
b. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
c. This table is used for Group R-2 occupancies consisting of sleeping units. For Group R-2 occupancies consisting of dwelling units, use Table 1006.3.3(1) ~~1021.2(1)~~..

~~**1021.2.1**~~ **1006.3.3.1 (IFC [B] ~~1021.2.1~~ 1006.3.3.1) Mixed occupancies.** Where one exit, or exit access stairway or ramp providing access to exits at other stories, is permitted to serve individual stories, mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1006.3.3(1) ~~1021.2(1)~~ or Table 1006.3.3(2) ~~1021.2(2)~~ for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. In each story of a mixed occupancy building, the maximum number of occupants served by a single exit shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants for each occupancy does not exceed one.

~~**1021.2.2**~~ **1006.3.4 (IFC [B] ~~1021.2.2~~ 1006.3.4) Basements.** A basement provided with one exit shall not be located more than one story below grade plane.

~~**1021.3 (IFC [B] 1021.3) Exit configuration.** Exits, or exit access stairways or ramps providing access to exits at other stories, shall be arranged in accordance with the provisions of Section 1015.2 through 1015.2.2. Exits shall be continuous from the point of entry into the exit to the exit discharge.~~

~~**1021.4**~~ **1006.3.5 (IFC [B] ~~1021.4~~ 1006.3.5) Vehicular ramps.** Vehicular ramps shall not be considered as an exit access ramp unless pedestrian facilities are provided.

1006.3.6 (IFC [B] 1006.3.6) Helistop Platforms. Helistop landing areas located on buildings or structures shall be provided with two exits, or exit access stairways or ramps providing access to exits.

> **Exception:** Landing platforms or roof areas for helistops that are less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m^2) in area, shall be permitted to access the second exit by a fire escape, alternating tread device or ladder leading to the story or level below.

SECTION 1007(IFC [B] 1007)
EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

~~**1015.2**~~ **1007.1 (IFC [B] ~~1015.2~~ 1007.1) General ~~Exit or exit access doorway arrangement~~.** Exits and exit access doorways serving spaces, including individual building stories, shall be separated in accordance with the provisions of this section. ~~Required *exits* shall be located in a manner that makes their availability obvious. *Exits* shall be unobstructed at all times. *Exit* and *exit access doorways* shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2.~~

~~**1015.2.1**~~ **1007.1.1 (IFC [B] ~~1015.2.1~~ 1007.1.1) Two exits or exit access doorways.** Where two *exits* or *exit access doorways* are required from any portion of the *exit access*, the *exit* doors or *exit access doorways* shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the story or area to be served measured in a straight line between *exit* doors or *exit access doorways*. Interlocking or *scissor stairs* shall be counted as one *exit stairway*.

Exceptions:

1 ~~2~~. Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the *exit* doors or *exit access doorways* shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

2 ~~1~~. Where interior exit stairways are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required exit separation shall be measured along the shortest direct line of travel within the corridor.

~~**1015.2.2**~~ **1007.1.2 (IFC [B] ~~1015.2.2~~ 1007.1.2) Three or more exits or exit access doorways.** Where access to three or more *exits* is required, at least two *exit* doors or *exit access doorways* shall be arranged in accordance with the provisions of Section 1007.1.1. Additional required exits, or access to exits shall be located a reasonable distance apart such that if one becomes involved, the others will be available.

1007.2 (IFC [B] 1007.2) Measurement. The required separation distance between exits or exit access doorways shall be measured in accordance with the following:

1. The separation distance to exit or exit access doorways shall be measured to the nearest point along the width of the doorway.
2. The separation distance to exit access stairways shall be measured to the closest riser.
3. The separation distance to exit access ramps shall be measured to the start of the ramp run.

(Renumber remaining sections.)

SECTION 1020 (IFC [B] 1020) EXITS

1020.1 (IFC [B] 1020.1) General. Exits shall comply with Sections 1020 through 1026 and the applicable requirements of Sections 1003 through 1013. An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge. Exits shall be continuous from the point of entry into the exit to the exit discharge.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

This proposal is a continuation of Item E5-09/10 that was approved for inclusion in the 2012 IBC. That is, the proposal intends to clarify current IBC means of egress requirements resulting in greater user friendliness and increased uniformity in the application of these important provisions.

Currently, both Sections 1015 and 1021 contain provisions for the determination of the number of exits and exit access doorways. The relationship between the two sections is not particularly obvious to many code practitioners. This proposal combines the two sections and places their various provisions in technical context. This is partially achieved through formatting. Section 1015.2 prescribes the provisions for the determination of the number of required exits or exit access to exits from any individual space. Section 1015.3 provides the provisions for the determination of the number of required exits or access to exits from stories or occupied roofs.

Recognizing the importance of tables during the design/review process, improvements were made to improve understanding and consistency. Fundamental to the proper determination of the number of required exits is the consideration of design occupant loads and occupant remoteness. Currently, only Table 1021.2(2) includes both variables (number of occupants per story and exit access travel distance). Section 1015.1 currently addresses the occupant load in Table 1015.1; however, it requires the user to determine occupant remoteness requirements at Section 1014.3 that are indicated as “common path of egress travel.” For the 2012 Edition of the IBC, common path of egress travel provisions have been consolidated into a tabular format. The only remaining text of Section 1014.3 states, “The common path of egress travel shall not exceed the common path of egress travel distances in Table 1014.3,” without contextual reference to Section 1015.1 that requires that two exits or exit access doorways from any space shall be provided where the common path of egress travel exceeds one of the limitations of Section 1014.3. This technical disconnect is repaired through the consolidation of Tables 1015.1 and 1014.3 in a format already contained in Table 1021.1(2). The current difference in occupant remoteness terminology (exit access travel distance vs. common path of egress travel) was resolved in favor of common path of egress travel distance.

To increase consistency in interpretations and application, the definition of “COMMON PATH OF EGRESS TRAVEL” has been modified. The proposed language emphasizes that the common path of egress travel is initially measured identically to exit access travel distance; however, technically terminates at an earlier point (that point where an occupant has separate and distinct access to two exits or exit access doorways vs. to an entrance to an exit). The somewhat vague wording in the current definition results in inconsistent applications of this important provision. It should be noted that the *NFPA 101 Handbook* states that common path of egress travel is a portion of the exit access travel distance. Many rely on that document to interpret IBC requirements. Additionally, the merging provision has been deleted. This is a moot point because once a second exit or exit access doorway (to include any point where an occupant enters an intervening room, corridor, exit access stairway or exit access ramp) is required, it must be separated in accordance with Section 1015.2. In recent code development cycles, many definitions have been edited to more accurately describe means of egress design requirements in context with the IBC system philosophy. This is another example of more accurately describing what is intended.

The establishment of a single method and term for the determination of occupant remoteness will greatly benefit code practitioners. The resultant Table 1006.2.1 is consistent in format, terminology and application to Table 1006.3.3(2) and will result in more accurate and consistent determination of the required number of exits and access to exits.

This proposal deletes current Section 1021.2, Exception 7. This provision was new to the 2009 Edition of the IBC and, according to the proponent’s reason statement, was intended to coordinate the fragmented requirements of Sections 1015 and 1021. The consolidation of the two sections eliminates the need for the provision. The exception can be considered moot because it represents an exception to a non-requirement. There is no requirement for specific spaces to be accessed by the remainder of the story. The performance nature of number of exits/exit access provisions allows each space to be designed based on its own technical merit on an individual and collective basis. The conditions of the exception simply restate fundamental means of egress provisions. Based on the stated requirements of this proposal, the deleted exception is unnecessary.

Formerly, both Sections 1015 and 1021 contained provisions for the determination of exit/exit access configuration/arrangement/separation. Inasmuch as this issue is a major means of egress design requirement, the provisions have been consolidated into a new stand-alone section, Section 1007. Additionally, separation measurement provisions have been clarified. Currently, there are no specific measurement points for the determination of exit/exit access separation. New Section 1007.2 provides guidance for measuring to doors, exit access stairways and exit access ramps. This will reduce subjectivity in the determination of exit/exit access configuration.

Numbers of exits/exit access doorways and exit/exit access doorway configuration provisions have been located in Sections 1006 and 1007 respectively. This creates a sectional sequence for occupant load based means of egress provisions. Section 1004 covers design occupant load determination. Means of egress sizing requirements based on occupant load are contained in Section 1005. Now, occupant load based numbers requirements are placed in Section 1006 with multiple exit/exit access doorway arrangement provisions following in Section 1007. This logical format should assist designers and enforcement officials alike.

It was also determined that a general exit provision addressing exit continuity is incorrectly located in current Section 1021.3. It has been properly located in Section 1020.1.

In summary, this proposal represents a continuing effort to improve means of egress provisions for the purposes of philosophical functionality, technical consistency and user friendliness. Approval of this proposal will simplify the interpretation and application of IBC means of egress provisions while maintaining the highest traditions of fire and life safety.

Cost Impact: This code change proposal will not increase the cost of construction.

E1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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E2-12

PART I – INTERNATIONAL BUILDING CODE

IBC 202, 403.5.1, 403.5.2, 505.3, 707.6, 707.7.1, 713.1, Table 716.5, 718.2.4, Table 803.9, 909.20.1, 909.20.4.4, 909.20.5, 909.20.6, 909.20.6.2, 1007.7.2, 1008.1.4.1, 1008.1.9.11, 1009.3, 1009.7.4, 1009.9.3, 1010.2, 1011.4, 1012.6, 1013.2, 1015.2.1, 1019.2, 1021.1, 1022.1, 1022.7, 1022.9, Table 1028.6.2, 1028.7, 1205.4, 1207.1, 2110.1.1, 2308.12.7, 2406.4.6, 2406.4.7, 3406.1.3, 3406.4, 3411.8.4; (IFC [B] 1007.7.2, 1008.1.4, 1008.1.9.11, 1009.3, 1009.7.4, 1009.9.3, 1010.2, 1011.4, 1012.6, 1013.2, 1015.2.1, 1019.2, 1021.1, 1022.1, 1022.7, 1022.9, Table 1028.6.2, 1028.7; IEBC [B] 405.1.3, 405.4, 410.8.4);

PART II - INTERNATIONAL MECHANCIAL CODE

IMC 306.5.1, 1107.2; (IFGC [M] 306.5.1)

PART III – INTERNATIONAL FIRE CODE

IFC 508.1.5, 905.3.3, 905.4, 905.4.1, 907.2.13.2, 907.5.2.2, 1104.5, 1104.6.1, 1104.9, 1104.10, 1104.10.1, 1104.12, 1104.16, 1104.16.1, 1104.16.2, 1104.16.3, 1104.16.4, 1104.16.5, 1104.16.5.1, 1104.16.6, 1104.16.7, 1104.20, 1104.21, 1104.23, 3313.1, 5704.2.9.4, 5706.5.1.12; (IBC [F] 911.1.5, 905.3.3, 905.4, 905.4.1, 907.2.13.2, 907.5.2.2, 3311.1; IEBC [F] 1506.1)

PART IV – INTERNATIONAL EXISTING BUILDING CODE

IEBC 804.1.1, 805.3.1.1, 805.3.1.2.1, 805.3.1.2.3, 805.4.3, 805.4.3.1, 805.9.1, 805.10.1, 806.2, 902.2.1, 1102.2, 1203.9, 1205.11

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

THIS IS A 4 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE AS 4 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMMITTEE.

PART I – INTERNATIONAL BUILDING CODE

Revise as follows:

CHAPTER 2
DEFINITIONS

SECTION 202
DEFINITIONS

EQUIPMENT PLATFORM. An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, ~~*stairs*~~ <u>*stairways*</u>, *alternating tread devices* and ladders necessary to access the platform (see Section 505.3).

EXIT. That portion of a *means of egress* system between the *exit access* and the *exit discharge* or *public way*. Exit components include exterior exit doors at the *level of exit discharge*, *interior exit stairways*~~,~~ ~~*interior exit*~~ <u>and</u> *ramps, exit passageways, exterior exit stairways* and ~~*exterior exit*~~ *ramps and horizontal exits*.

EXIT ACCESS DOORWAY. A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, *corridor*, *exit access* ~~*stair*~~ <u>*stairway*</u> or ~~*exit access*~~ *ramp*.

FLOOR AREA, GROSS. The floor area within the inside perimeter of the *exterior walls* of the building under consideration, exclusive of vent *shafts* and *courts*, without deduction for *corridors*, *stairways*, ramps, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding *exterior walls* shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area shall not include *shafts* with no openings or interior *courts.*

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as *corridors*, *stairways,* ramps toilet rooms, mechanical rooms and closets.

SCISSOR ~~STAIR~~ STAIRWAY. Two interlocking *stairways* providing two separate paths of egress located within one ~~stairwell~~ exit enclosure.

~~STAIR~~ STAIRWAY, SCISSOR. See "Scissor ~~stair~~ stairway."

Revise as follows:

CHAPTER 4
SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

SECTION 403
HIGHRISE BUILDINGS

403.5.1 Remoteness of interior exit stairways. Required *interior exit stairways* shall be separated by a distance not less than 30 feet (9144 mm) or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the *interior exit stairways*. In buildings with three or more *interior exit stairways,* no fewer than two of the *interior exit stairways* shall comply with this section. Interlocking or *scissor ~~stairs~~ stairways* shall be counted as one *interior exit stairway.*

403.5.2 Additional exit stairway. For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in *building height*, one additional *exit stairway* meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of *exits* required by Section 1021.1. The total width of any combination of remaining *exit stairways* with one *exit stairway* removed shall be not less than the total width required by Section 1005.1. *Scissor ~~stairs~~ stairways* shall not be considered the additional *exit stairway* required by this section.

> **Exception:** An additional *exit stairway* shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.

Revise as follows:

CHAPTER 5
GENERAL BUILDING HEIGHTS AND AREAS

SECTION 505
MEZZANINES AND EQUIPMENT PLATFORMS

IBC 505.3 Equipment platforms. *Equipment platforms* in buildings shall not be considered as a portion of the floor below. Such *equipment platforms* shall not contribute to either the *building area* or the number of *stories* as regulated by Section 503.1. The area of the *equipment platform* shall not be included in determining the *fire area* in accordance with Section 903. *Equipment platforms* shall not be a part of any *mezzanine* and such platforms and the walkways, ~~*stairs*~~ *stairways*, *alternating tread devices* and ladders providing access to an *equipment platform* shall not serve as a part of the *means of egress* from the building.

Revise as follows:

CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

SECTION 707
FIRE BARRIERS

707.6 Openings. Openings in a fire barrier shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m2). Openings in enclosures for exit access stairways and ramps, interior exit stairways and ramps and exit passageways shall also comply with Sections 1022.3 and 1023.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door serving enclosures for exit access stairways~~, exit access~~ and ramps, and interior exit stairways and ~~interior exit~~ ramps.
3. Openings shall not be limited to 156 square feet (15 m2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTME 119 or UL263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a fire barrier separating an enclosures for exit access stairways~~, exit access~~ and ramps, and interior exit stairways and ~~interior exit~~ ramps from an exit passageway in accordance with Section 1022.2.1.

707.7.1 Prohibited penetrations. Penetrations into enclosures for exit access stairways~~, exit access~~ and ramps, interior exit stairways~~, interior exit~~ and ramps or an exit passageway shall be allowed only when permitted by Section 1009.3.1.5, 1022.5 or 1023.6, respectively.

SECTION 713
SHAFT ENCLOSURES

713.1 General. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Exit access stairways and ~~exit access~~ ramps shall be protected in accordance with the applicable provisions of Section 1009. Interior exit stairways and ~~interior exit~~ ramps shall be protected in accordance with the requirements of Section 1022.

Revise as follows:

SECTION 716
OPENING PROTECTIVES

TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

Type of Assembly
Fire barriers having a required fireresistance rating of 1 hour: Enclosures for shafts, exit access stairways~~,~~ ~~exit access~~ and ramps, interior exit stairways~~, interior exit~~ and ramps and exit passageway walls

(Portions of table not shown remain unchanged.)

SECTION 718
CONCEALED SPACES

718.2.4 Stairways. Fireblocking shall be provided in concealed spaces between *stair* stringers at the top and bottom of the run. Enclosed spaces under ~~*stairs*~~ *stairways* shall also comply with Section 1009.9.3.

Revise as follows:

CHAPTER 8
INTERIOR FINISHES

SECTION 803
WALL AND CEILING FINISHES

TABLE 803.9
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY[k]

Group	SPRINKLERED			NONSPRINKLERED		
	Interior exit stairways~~,~~ ~~interior exit~~ and ramps and exit passageways[a, b]	**Corridors and enclosure for exit access stairways and ~~exit access~~ ramps**	**Rooms and enclosed spaces[c]**	**Interior exit stairways~~,~~ ~~interior exit~~ and ramps and exit passageways[a, b]**	**Corridors and enclosure for exit access stairways and ~~exit access~~ ramps**	**Rooms and enclosed spaces[c]**

b. In other than Group I-2 occupancies in buildings less than three stories above grade plane of other than Group I-3, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.

j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.

(Portions of table and notes not shown remain unchanged)

Revise as follows:

CHAPTER 9
FIRE PROTECTION SYSTEMS

SECTION 909
SMOKE CONTROL SYSTEMS

909.20.1 Access. Access to the ~~*stair*~~ *stairway* shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall not be less than the required width of the *corridor* leading to the vestibule but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

909.20.4.4 ~~Stair~~ Stairway shaft air movement system. The ~~*stair*~~ *stairway* shaft shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the shaft relative to the vestibule with all doors closed.

909.20.5 ~~Stair~~ Stairway pressurization alternative. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that interior *exit stairways* are pressurized to a minimum of 0.10 inches of water (25 Pa) and a maximum of 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all interior *exit stairway* doors closed under maximum anticipated conditions of stack effect and wind effect.

909.20.6 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the ~~*stair*~~ *stairway* shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.6.2 Standby power. Mechanical vestibule and ~~*stair*~~ *stairway* shaft ventilation systems and automatic fire detection systems shall be powered by an *approved* standby power system conforming to Section 403.4.8 and Chapter 27.

Revise as follows:

CHAPTER 10
MEANS OF EGRESS

SECTION 1007 (IFC [B] 1007)
ACCESSIBLE MEANS OF EGRESS

1007.7.2 (IFC [B] 1007.7.2) Outdoor facilities. Where *exit access* from the area serving outdoor facilities is essentially open to the outside, an exterior area of assisted rescue is permitted as an alternative to an *area of refuge*. Every required exterior area of assisted recue shall have direct access to an *interior exit stairway*, exterior exit *stairway*, or elevator serving as an *accessible means of egress* component. The exterior area of assisted rescue shall comply with Section 1007.7.3 through 1007.7.6 and shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

SECTION 1008 (IFC [B] 1008)
DOORS, GATES AND TURNSTILES

1008.1.4.1 (IFC [B] 1008.1.4.1) Revolving doors. Revolving doors shall comply with the following:

1. Each revolving door shall be capable of collapsing into a bookfold position with parallel egress paths providing an aggregate width of 36 inches (914 mm).
2. A revolving door shall not be located within 10 feet (3048 mm) of the foot of or top of ~~*stairs*~~ *stairways* or escalators. A dispersal area shall be provided between the ~~*stairs*~~ *stairways* or escalators and the revolving doors.
3. The revolutions per minute (rpm) for a revolving door shall not exceed those shown in Table 1008.1.4.1.
4. Each revolving door shall have a side-hinged swinging door which complies with Section 1008.1 in the same wall and within 10 feet (3048 mm) of the revolving door.
5. Revolving doors shall not be part of an *accessible route* required by Section 1007 and Chapter 11.

1008.1.9.11 (IFC [B] 1008.1.9.11) Stairway doors. Interior *stairway means of egress* doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Stairway* discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
3. In *stairways* serving not more than four stories, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.
4. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single *exit* ~~*stair*~~ *stairway* where permitted in Section 1021.2.
5. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the dwelling unit is from a single *exit* ~~*stair*~~ *stairway* where permitted in Section 1021.2.

SECTION 1009 (IFC [B] 1009)
STAIRWAYS

1009.3 (IFC [B] 1009.3) Exit access stairways. Floor openings between stories created by *exit access stairways* shall be enclosed.

Exceptions:

1. In other than Group I-2 and I-3 occupancies, *exit access stairways* that serve, or atmospherically communicate between, only two stories are not required to be enclosed.
2. *Exit access stairways* serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
3. In buildings with only Group B or M occupancies, *exit access stairway* openings are not required to be enclosed provided that the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the *exit access stairway*, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
4. In other than Groups B and M occupancies, *exit access stairway* openings are not required to be enclosed provided that the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the *exit access stairway*, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
5. *Exit access stairways* within an *atrium* complying with the provisions of Section 404 are not required to be enclosed.
6. *Exit access stairways* ~~and *ramps*~~ in open parking garages that serve only the parking garage are not required to be enclosed.
7. *Exit access Stairways* serving outdoor facilities where all portions of the *means of egress* are essentially open to the outside are not required to be enclosed.
8. *Exit access stairways* serving stages, platforms and *technical production areas* in accordance with Sections 410.6.2 and 410.6.3 are not required to be enclosed.
9. *Exit access Stairways* are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
10. In Group I-3 occupancies, *exit access stairways* constructed in accordance with Section 408.5 are not required to be enclosed.

1009.7.4 (IFC [B] 1009.7.4) Dimensional uniformity. *Stair* treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 3/8 inch (9.5 mm) in any *flight* of *stairs*. The greatest *winder* tread depth at the walkline within any *flight* of *stairs* shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Exceptions:

1. Nonuniform riser dimensions of *aisle stairs* complying with Section 1028.11.2.
2. Consistently shaped *winders*, complying with Section 1009.7, differing from rectangular treads in the same ~~*stairway*~~ *flight* *of stairs*.

Where the bottom or top riser adjoins a sloping *public way*, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of ~~*stairway*~~ *stair* width. The *nosings* or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other *nosing* marking provided on the *stair flight*. The distinctive marking stripe shall be visible in descent of the *stair* and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

1009.9.3 (IFC [B] 1009.9.3) Enclosures under interior stairways. The walls and soffits within enclosed usable spaces under enclosed and unenclosed *stairways* shall be protected by 1-hour fire-resistance-rated construction or the *fire-resistance rating* of the *stairway* enclosure, whichever is greater. Access to the enclosed space shall not be directly from within the ~~*stair*~~ *stairway* enclosure.
Exception: Spaces under *stairways* serving and contained within a single residential dwelling unit in Group R-2 or R-3 shall be permitted to be protected on the enclosed side with 1/2-inch (12.7 mm) gypsum board.

SECTION 1010 (IFC [B] 1010)
RAMPS

1010.2 (IFC [B] 1010.2) Enclosure. All *interior exit ramps* shall be enclosed in accordance with the applicable provisions of Section 1022. *Exit access ramps* shall be enclosed in accordance with the provisions of ~~Section~~ Sections 1009.2, 1009. 3 and 1009.4 for enclosure of *stairways*.

SECTION 1011 (IFC [B] 1011)
EXIT SIGNS

1011.4 (IFC [B] 1011.4) Raised character and Braille exit signs. A sign stating EXIT in raised characters and Braille and complying with ICC A117.1 shall be provided adjacent to each door to an *area of refuge*, an exterior area for assisted rescue, an *exit stairway*~~, an *exit*~~ *or* *ramp*, an *exit passageway* and the *exit discharge*.

SECTION 1012 (IFC [B] 1012)
HANDRAILS

1012.6 (IFC [B] 1012.6) Handrail extensions. *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent ~~*stair*~~ *flight* of stairs or *ramp* run. Where *handrails* are not continuous between *flights,* the *handrails* shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. The extensions of *handrails* shall be in the same direction of the ~~*stair*~~ *flights* of stairs at *stairways* and the *ramp* runs at *ramps*.

Exceptions:

1. *Handrails* within a *dwelling unit* that is not required to be *accessible* need extend only from the top riser to the bottom riser.
2. *Aisle handrails* in rooms or spaces used for assembly purposes in accordance with Section 1028.13.
3. *Handrails* for *alternating tread devices* and ship ladders are permitted to terminate at a location vertically above the top and bottom risers. *Handrails* for *alternating tread devices* and ship ladders are not required to be continuous between *flights* or to extend beyond the top or bottom risers.

SECTION 1013 (IFC [B] 1013)
GUARDS

1013.2 (IFC [B] 1013.2) Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, *equipment platforms*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.8.

Exception: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including ~~steps~~ stairs leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of stages and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where *guards* in accordance with Section 1028.14 are permitted and provided.

SECTION 1015 (IFC [B] 1015)
EXIT AND EXIT ACCESS DOORWAYS

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways. Where two *exits* or *exit access doorways* are required from any portion of the *exit access*, the *exit* doors or *exit access doorways* shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between *exit* doors or *exit access doorways*. Interlocking or *scissor* ~~*stairs*~~ stairways shall be counted as one *exit stairway*.

Exceptions:

1 Where *interior exit stairways* are interconnected by a 1-hour fire-resistance-rated *corridor* conforming to the requirements of Section 1018, the required *exit* separation shall be measured along the shortest direct line of travel within the *corridor*.
2. Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the *exit* doors or *exit access doorways* shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

SECTION 1019 (IFC [B] 1019)
EGRESS BALCONIES

1019.2 (IFC [B] 1019.2) Wall separation. Exterior egress balconies shall be separated from the interior of the building by walls and opening protectives as required for *corridors*.
Exception: Separation is not required where the exterior egress balcony is served by at least two ~~*stairs*~~ *stairways* and a deadend travel condition does not require travel past an unprotected opening to reach a ~~*stair*~~ *stairway*.

SECTION 1021 (IFC [B] 1021)
NUMBER OF EXITS AND EXIT CONFIGURATION

1021.1 (IFC [B] 1021.1.) General. Each story and occupied roof shall have the minimum number of *exits*, or access to exits, as specified in this section. The required number of *exits*, or *exit access stairways* or *ramps* providing access to exits, from any story shall be maintained until arrival at grade or a *public way*. *Exits* or access to exits from any story shall be configured in accordance with this section. Each story above the second story of a building shall have a minimum of one interior or exterior *exit stairway*~~,~~ or ~~interior or exterior *exit*~~ *ramp*. At each story above the second story that requires a minimum of three or more *exits*, or access to *exits*, a minimum of 50 percent of the required *exits* shall be interior or exterior *exit stairways*~~,~~ or ~~interior or exterior *exit*~~ *ramps*.

Exceptions:

1. *Interior exit stairways* and ~~*interior exit*~~ *ramps* are not required in *open parking garages* where the *means of egress* serves only the *open parking garage*.
2. *Interior exit stairways* and ~~*interior exit*~~ *ramps* are not required in outdoor facilities where all portions of the *means of egress* are essentially open to the outside.

SECTION 1022 (IFC [B] 1022)
INTERIOR EXIT STAIRWAYS AND RAMPS

1022.1 (IFC [B] 1022.1) General. *Interior exit stairways* and ~~*interior exit*~~ *ramps* serving as an *exit* component in a *means of egress* system shall comply with the requirements of this section. *Interior exit stairways* and *ramps* shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an *exit passageway* conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An *interior exit stairway* or *ramp* shall not be used for any purpose other than as a *means of egress*.

1022.7 (IFC [B] 1022.7) Interior exit stairway and ramp exterior walls. *Exterior walls* of the *interior exit stairway* and *ramp* shall comply with the requirements of Section 705 for exterior walls. Where nonrated walls or unprotected openings enclose the exterior of the *stairway* <u>or ramps</u> and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building *exterior walls* within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a *fire-resistance rating* of not less than 1 hour. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the *stairway*<u>, ramp</u> or to the roof line, whichever is lower.

1022.9 (IFC [B] 1022.9) Stairway identification signs. A sign shall be provided at each floor landing in an *interior exit stairway* and *ramp* connecting more than three stories designating the floor level, the terminus of the top and bottom of the *interior exit stairway* and *ramp* and the identification of the ~~*stair*~~ *stairway* or *ramp*. The signage shall also state the story of, and the direction to, the *exit discharge* and the availability of roof access from the *interior exit stairway* and *ramp* for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. In addition to the *stairway* identification sign, a floor level sign in raised characters and braille complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the *interior exit stairway* and *ramp* into the *corridor* to identify the floor level.

SECTION 1028 (IFC [B] 1028)
ASSEMBLY

TABLE 1028.6.2 (IFC [B] Table 1028.6.2)
WIDTH OF AISLES FOR SMOKE-PROTECTED ASSEMBLY

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY SEATING	INCHES OF CLEAR WIDTH PER SEAT SERVED			
	~~Stairs and~~ aisle ~~steps~~ stairs with handrails within 30 inches	~~Stairs and~~ aisle ~~steps~~ stairs without handrails within 30 inches	~~Passageways, doorways and~~ Level and ramped aisles ~~ramps~~ not steeper than 1 in 10 in slope	~~Ramps~~ Ramped aisles steeper than 1 in 10 in slope

(Portions of table not shown remain unchanged)

1028.7 (IFC [B] 1028.7) Travel distance. *Exits* and *aisles* shall be so located that the travel distance to an *exit* door shall not be greater than 200 feet (60 960 mm) measured along the line of travel in nonsprinklered buildings. Travel distance shall not be more than 250 feet (76 200 mm) in sprinklered buildings. Where *aisles* are provided for seating, the distance shall be measured along the *aisles* and *aisle accessway* without travel over or on the seats.

Exceptions:

1. *Smoke-protected assembly seating*: The travel distance from each seat to the nearest entrance to a vomitory or concourse shall not exceed 200 feet (60 960 mm). The travel distance from the entrance to the vomitory or concourse to a ~~*stair*~~ *stairway*, *ramp* or walk on the exterior of the building shall not exceed 200 feet (60 960 mm).
2. Open-air seating: The travel distance from each seat to the building exterior shall not exceed 400 feet (122 m). The travel distance shall not be limited in facilities of Type I or II construction.

Revise as follows:

CHAPTER 12
INTERIOR ENVIRONMENT

SECTION 1205
LIGHTING

1205.4 Stairway illumination. *Stairways* within *dwelling units* and *exterior stairways* serving a *dwelling unit* shall have an illumination level on tread runs of not less than 1 foot-candle (11 lux). ~~*Stairs*~~ *Stairways* in other occupancies shall be governed by Chapter 10.

SECTION 1207
SOUND TRANSMISSION

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* or between *dwelling units* and adjacent public areas such as halls, *corridors*, ~~*stairs*~~ *stairways* or service areas.

Revise as follows:

CHAPTER 21
MASONRY

SECTION 2110
GLASS UNIT MASONRY

2110.1.1 Limitations. Solid or hollow *approved* glass block shall not be used in fire walls, party walls, fire barriers, fire partitions or smoke barriers, or for load-bearing construction. Such blocks shall be erected with mortar and reinforcement in metal channel-type frames, structural frames, masonry or concrete recesses, embedded panel anchors as provided for both exterior and interior walls or other *approved* joint materials. Wood strip framing shall not be used in walls required to have a fire-resistance rating by other provisions of this code.

Exceptions:

1. Glass-block assemblies having a fire protection rating of not less than 3/4 hour shall be permitted as opening protectives in accordance with Section 716 in fire barriers, fire partitions and smoke barriers that have a required fire-resistance rating of 1 hour or less and do not enclose exit stairways~~, exit~~ and ramps or exit passageways.
2. Glass-block assemblies as permitted in Section 404.6, Exception 2.

Revise as follows:

CHAPTER 23
WOOD

SECTION 2308
CONVENTIONAL LIGHT-FRAMED CONSTRUCTION

2308.12.7 Anchorage of exterior means of egress components. Exterior egress balconies, exterior ~~exit~~ stairways or ramps and similar *means of egress* components shall be positively anchored to the primary structure at not over 8 feet (2438 mm) o.c. or shall be designed for lateral forces. Such attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

Revise as follows:

CHAPTER 24
GLASS AND GLAZING

SECTION 2406
SAFETY GLAZING

2406.4.6 Glazing adjacent to ~~stairs~~ stairways and ramps. Glazing where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs, and ramps shall be considered a hazardous location.

Exceptions:

1. The side of a stairway, landing or ramp that has a guard complying with the provisions of Sections 1013 and 1607.8, and the plane of the glass is greater than 18 inches (457 mm) from the railing.
2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.

2406.4.7 Glazing adjacent to the bottom ~~stair~~ stairway landing. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within 60 inches (1524 mm) horizontally of the bottom tread shall be considered a hazardous location.

> **Exception:** Glazing that is protected by a guard complying with Sections 1013 and 1607.8 where the plane of the glass is greater than 18 inches (457 mm) from the guard.

Revise as follows:

CHAPTER 34
EISTING STRUCTURES

SECTION 3406 (IEBC [B] 405)
FIRE ESCAPES

3406.1.3 (IEBC [B] 405.1.3) New fire escapes. New fire escapes for existing buildings shall be permitted only where exterior *~~stairs~~* *stairways* cannot be utilized due to lot lines limiting *~~stair~~* *stairway* size or due to the sidewalks, alleys or roads at grade level. New fire escapes shall not incorporate ladders or access by windows.

3406.4 (IEBC [B] 405.4) Dimensions. *Stairs* shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm) and landings at the foot of ~~stairs~~ stairways not less than 40 inches (1016 mm) wide by 36 inches (914 mm) long, located not more than 8 inches (203 mm) below the door.

SECTION 3411 (IEBC [B] 410)
ACCESSIBILITY FOR EXISTING BUILDINGS

3411.8.4 (IEBC [B] 410.8.4) ~~Stairs~~ Stairways and escalators in existing buildings. In *alterations*, change of occupancy or *additions* where an escalator or *~~stair~~* *stairway* is added where none existed previously and major structural modifications are necessary for installation, an *accessible* route shall be provided between the levels served by the escalator or *~~stairs~~* *stairways* in accordance with Sections 1104.4 and 1104.5.

PART II - INTERNATIONAL MECHANICAL CODE

Revise as follows:

IMC CHAPTER 3
GENERAL REGULATIONS

IMC SECTION 306
ACCCESS AND SERVICE SPACE

IMC 306.5.1 (IFGC [M] 306.5.1) Sloped roofs. Where appliances, *equipment*, fans or other components that require service are installed on a roof having a slope of three units vertical in 12 units horizontal (25-percent slope) or greater and having an edge more than 30 inches (762 mm) above grade at such edge, a level platform shall be provided on each side of the *appliance* or *equipment* to which access is required for service, repair or maintenance. The platform shall be not less than 30 inches (762 mm) in any dimension and shall be provided with guards. The guards shall extend not less than 42 inches (1067 mm) above the platform, shall be constructed so as to prevent the passage of a 21-inch diameter (533 mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code*. Access shall not require walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Where access involves obstructions greater than 30 inches (762 mm) in height, such obstructions shall be provided with ladders installed in accordance with Section 306.5 or ~~stairs~~ stairways installed in accordance with the requirements specified in the *International Building Code* in the path of travel to and from appliances, fans or *equipment* requiring service.

IMC CHAPTER 11
REFRIGERATION

IMC SECTION 1107
REFRIGERANT PIPING

IMC 1107.2 Piping location. Refrigerant piping that crosses an open space that affords passageway in any building shall be not less than 7 feet 3 inches (2210 mm) above the floor unless the piping is located against the ceiling of such space. Refrigerant piping shall not be placed in any elevator, dumbwaiter or other shaft containing a moving object or in any shaft that has openings to living quarters or to means of egress. Refrigerant piping shall not be installed in an enclosed public stairway, ~~stair~~ stairway landing or means of egress.

PART III – INTERNATIONAL FIRE CODE

Revise as follows:

IFC CHAPTER 5
FIRE SERVICE FEATURES

IFC SECTION 508 (IBC [F] 911)
FIRE COMMAND CENTER

IFC 508.1.5 (IBC [F] 911.1.5) Required features. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking interior exit *stairway* doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, fire protection systems, fire-fighting equipment and fire department access and the location of *fire walls, fire barriers, fire partitions, smoke barriers* and smoke partitions.
13. An approved Building Information Card that contains, but is not limited to, the following information:
    - 13.1 General building information that includes: property name, address, the number of floors in the building (above and below grade), use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), estimated building population (i.e., day, night, weekend);
    - 13.2 Building emergency contact information that includes: a list of the building's emergency contacts (e.g., building manager, building engineer, etc.) and their respective work phone number, cell phone number, email address;
    - 13.3 Building construction information that includes: the type of building construction (e.g., floors, walls, columns, and roof assembly);
    - 13.4 *Exit access and* *exit* ~~*stair*~~ *stairway* information that includes: number of *exit access and exit* ~~*stair*~~ *stairway* in building, each *exit access and* *exit* ~~*stair*~~ *stairway* designation and floors served, location where each *exit access and exit* ~~*stair*~~ *stairway* discharges, interior *exit* ~~*stairs*~~ *stairways* that are pressurized, *exit* ~~*stairs*~~ *stairways* provided with emergency lighting, each *exit* ~~*stairs*~~ *stairways* that allows reentry, *exit* ~~*stairs*~~ *stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine rooms, location of sky lobby, location of freight elevator banks;
    - 13.5 Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, location of natural gas service;
    - 13.6 Fire protection system information that includes: locations of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers, location of different types of sprinkler systems installed (e.g., dry, wet, pre-action, etc.);
    - 13.7 Hazardous material information that includes: location of hazardous material, quantity of hazardous material.

14. Work table.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.
17. Elevator fire recall switch in accordance with ASME A17.1.
18. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

IFC CHAPTER 9
FIRE PROTECTION SYSTEMS

IFC SECTION 905
STANDPIPE SYSTEMS

IFC 905.3.3 (IBC [F] 905.3.3) Covered and open mall buildings. Covered mall and open mall buildings shall be equipped throughout with a standpipe system where required by Section 905.3.1. Mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the *automatic sprinkler system* sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed to not exceed a 50 pounds per square inch (psi) (345 kPa) residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each *exit* passageway or *corridor*.
2. At each floor-level landing within ~~enclosed~~ <u>interior exit</u> stairways opening directly on the mall.
3. At exterior public entrances to the mall of a covered mall building.
4. At public entrances at the perimeter line of an open mall building.

IFC 905.4 (IBC [F] 905.4) Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required <u>interior exit</u> *stairway*, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise *approved* by the fire code official.
2. On each side of the wall adjacent to the *exit* opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from <u>an interior</u> *exit stairway* hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit*.

3. In every *exit* passageway, at the entrance from the *exit* passageway to other areas of a building.

   Exception: Where floor areas adjacent to an *exit* passageway are reachable from <u>an interior</u> *exit stairway* hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit* passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of ~~a~~ <u>an interior exit</u> stairway with ~~stair~~ access to the roof provided in accordance with Section 1009.16.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more

than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

IFC 905.4.1 (IBC [F] 905.4.1) Protection. Risers and laterals of Class I standpipe systems not located within an ~~enclosed~~ interior exit *stairway* ~~or pressurized enclosure~~ shall be protected by a degree of *fire resistance* equal to that required for vertical enclosures in the building in which they are located.

Exception: In buildings equipped throughout with an *approved automatic sprinkler system*, laterals that are not located within an ~~enclosed~~ interior exit *stairway* ~~or pressurized enclosure~~ are not required to be enclosed within fire-resistance- rated construction.

IFC SECTION 907 (IBC [F] 907)
FIRE ALARM AND DETECTION SYSTEMS

IFC 907.2.13.2 (IBC [F] 907.2.13.2) Fire department communication system. Where a wired communication system is *approved* in lieu of an emergency responder radio coverage system in accordance with Section 510 of the *International Fire Code*, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 and shall operate between a fire command center complying with Section 911, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, *areas of refuge* and inside ~~enclosed~~ *interior exit stairways*. The fire department communication device shall be provided at each floor level within the ~~enclosed~~ *interior exit stairway*.

IFC 907.5.2.2 (IBC [F] 907.5.2.2) Emergency voice/alarm communication systems. Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. The operation of any automatic fire detector, sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving *approved* information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by Section 404 of the *International Fire Code*. In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Interior *Exit stairways*.
3. Each floor.
4. *Areas of refuge* as defined in Section 1002.1.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.

IFC CHAPTER 11
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

IFC SECTION 1104
MEANS OF EGRESS FOR EXISTING BUILDINGS

IFC 1104.5 Illumination emergency power. The power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more *means of egress:*

1 and 2 *(No change)*
3. Group E in interior ~~stairs~~ exit access and exit stairways and ramps, *corridors,* windowless areas with student occupancy, shops and laboratories.
4 through 9 *(No change)*

IFC 1104.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards on the open side of ~~*stairs*~~ stairways shall be not less than 30 inches (760 mm) high.
2. Existing guards within *dwelling units* shall be not less than 36 inches (910 mm) high.
3. Existing guards in assembly seating areas.

IFC 1104.9 Revolving doors. Revolving doors shall comply with the following:

1. A revolving door shall not be located within 10 feet (3048 mm) of the foot or top of ~~stairs~~ stairways or escalators. A dispersal area shall be provided between the ~~stairs~~ stairways or escalators and the revolving doors.
2. The revolutions per minute for a revolving door shall not exceed those shown in Table 1104.9.
3. Each revolving door shall have a conforming side hinged swinging door in the same wall as the revolving door and within 10 feet (3048 mm).

   Exceptions:

   1. A revolving door is permitted to be used without an adjacent swinging door for street-floor elevator lobbies provided a stairway, escalator or door from other parts of the building does not discharge through the lobby and the lobby does not have any occupancy or use other than as a means of travel between elevators and a street.
   2. Existing revolving doors where the number of revolving doors does not exceed the number of swinging doors within 20 feet (6096 mm).

IFC 1104.10 Stair dimensions for existing ~~stairs~~ stairways. Existing ~~stairs~~ stairways in buildings shall be permitted to remain if the rise does not exceed 81/4 inches (210 mm) and the run is not less than 9 inches (229 mm). Existing ~~stairs~~ stairways can be rebuilt.

Exception: Other ~~stairs~~ stairways *approved* by the *fire code official*.

IFC 1104.10.1 Dimensions for replacement ~~stairs~~ stairways. The replacement of an existing *stairway* in a structure shall not be required to comply with the new *stairway* requirements of Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

IFC 1104.12 ~~Circular~~ Curved stairways. Existing ~~circular~~ ~~stairs~~ curved stairways shall be allowed to continue in use provided the minimum depth of tread is 10 inches (254 mm) and the smallest radius shall not be less than twice the width of the *stairway*.

IFC 1104.16 Fire escape ~~stairs~~ stairways. Fire escape ~~stairs~~ stairways shall comply with Sections 1104.16.1 through 1104.16.7.

IFC 1104.16.1 Existing means of egress. Fire escape ~~stairs~~ stairways shall be permitted in existing buildings but shall not constitute more than 50 percent of the required *exit* capacity.

IFC 1104.16.2 Protection of openings. Openings within 10 feet (3048 mm) of fire escape ~~stairs~~ stairways shall be protected by opening protectives having a minimum 3/4-hour *fire protection rating*.

Exception: In buildings equipped throughout with an *approved automatic sprinkler system*, opening protection is not required.

IFC 1104.16.3 Dimensions. Fire escape ~~stairs~~ stairways shall meet the minimum width, capacity, riser height and tread depth as specified in Section 1104.10.

IFC 1104.16.4 Access. Access to a fire escape ~~stair~~ stairway from a *corridor* shall not be through an intervening room. Access to a fire escape ~~stair~~ stairway shall be from a door or window meeting the criteria of Section 1005.1. Access to a fire escape ~~stair~~ stairway shall be directly to a balcony, landing or platform. These shall be no higher than the floor or window sill level and no lower than 8 inches (203 mm) below the floor level or 18 inches (457 mm) below the window sill.

IFC 1104.16.5 Materials and strength. Components of fire escape ~~stairs~~ stairways shall be constructed of noncombustible materials. Fire escape ~~stairs~~ stairways and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m2). Fire escape ~~stairs~~ stairways and balconies shall be provided with a top and intermediate handrail on each side.

IFC 1104.16.5.1 Examination. Fire escape ~~stairs~~ stairways and balconies shall be examined for structural adequacy and safety in accordance with Section 1104.16.5 by a registered design professional or others acceptable to the *fire code official* every five years, or as required by the *fire code official*. An inspection report shall be submitted to the *fire code official* after such examination.

IFC 1104.16.6 Termination. The lowest balcony shall not be more than 18 feet (5486 mm) from the ground. Fire escape ~~stairs~~ stairways shall extend to the ground or be provided with counterbalanced ~~stairs~~ stairways reaching the ground.

> **Exception:** For fire escape ~~stairs~~ stairways serving 10 or fewer occupants, an *approved* fire escape ladder is allowed to serve as the termination.

IFC 1104.16.7 Maintenance. Fire escapes stairways shall be kept clear and unobstructed at all times and shall be maintained in good working order.

IFC 1104.20 Stairway discharge identification. An interior *exit stairway* or *ramp* which continues below its *level of exit discharge* shall be arranged and marked to make the direction of egress to a *public way* readily identifiable.

> **Exception:** ~~Stairs~~ Stairways that continue one-half story beyond their *levels of exit discharge* need not be provided with barriers where the *exit discharge* is obvious.

IFC 1104.21 Exterior stairway protection. Exterior *exit* ~~stairs~~ stairways shall be separated from the interior of the building as required in Section 1026.6. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for buildings that are two stories or less above grade where the *level of exit discharge* serving such occupancies is the first story above grade.
2. Separation from the interior of the building is not required where the exterior *stairway* is served by an exterior balcony that connects two remote exterior *stairways* or other *approved exits*, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the opening not less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior *stairway* located in a building or structure that is permitted to have unenclosed interior *stairways* in accordance with Section 1022.
4. Separation from the interior of the building is not required for exterior *stairways* connected to open ended *corridors*, provided that:
   - 4.1. The building, including *corridors* and ~~stairs~~ stairways, is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 4.2. The open-ended *corridors* comply with Section 1018.

4.3. The open-ended *corridors* are connected on each end to an exterior *exit stairway* complying with Section 1026.
4.4. At any location in an open-ended *corridor* where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3 m2) or an exterior *stairway* shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

IFC 1104.23 Stairway floor number signs. Existing ~~stairs~~ stairways shall be marked in accordance with Section 1022.8.

IFC CHAPTER 33
FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

IFC SECTION 3313 (IBC [F] 3311; IEBC [F] 1506.1)
STANDPIPES

IFC 3313.1 (IBC [F] 3311.1; IEBC [F] 1506.1) Where required. In buildings required to have standpipes by Section 905.3.1, no fewer than one standpipe shall be provided for use during construction. Such standpipes shall be installed when the progress of construction is not more than 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipe shall be provided with fire department hose connections at accessible locations adjacent to usable ~~stairs~~ stairways. Such standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring.

IFC CHAPTER 57
FLAMMABLE AND COMBUSTIBLE LIQUIDS

IFC SECTION 5704
STORAGE

IFC 5704.2.9.4 ~~Stairs~~ Stairways, platforms and walkways. ~~Stairs~~ Stairways, platforms and walkways shall be of noncombustible construction and shall be designed and constructed in accordance with NFPA 30 and the *International Building Code*.

IFC 5706.5.1.12 Loading racks. Where provided, loading racks, ~~stairs~~ stairways or platforms shall be constructed of noncombustible materials. Buildings for pumps or for shelter of loading personnel are allowed to be part of the loading rack. Wiring and electrical equipment located within 25 feet (7620 mm) of any portion of the loading rack shall be in accordance with Section 5703.1.1.

PART IV – INTERNATIONAL EXISTING BUILDING CODE

IEBC CHAPTER 8
ALTERATIONS—LEVEL 2

IEBC SECTION 804
FIRE PROTECTION

IEBC 804.1.1 Corridor ratings. Where an approved automatic sprinkler system is installed throughout the story, the required fire-resistance rating for any corridor located on the story shall be permitted to be reduced in accordance with the *International Building Code*. In order to be considered for a corridor rating reduction, such system shall provide coverage for the ~~stairwell~~ stairway landings serving the floor and the intermediate landings immediately below.

IEBC SECTION 805
MEANS OF EGRESS

IEBC 805.3.1.1 Single-exit buildings. Only one exit is required from buildings and spaces of the following occupancies:

1. through 8. *(No change)*
9. In buildings of Group R-2 occupancy of any height with not more than four dwelling units per floor; with a smokeproof enclosure or outside ~~stair~~ stairway as an exit; and with such exit located within 20 feet (6096 mm) of travel to the entrance doors to all dwelling units served thereby.
10. *(No change)*

IEBC 805.3.1.2.1 Fire escape access and details. Fire escapes shall comply with all of the following requirements:

1. and 2. *(No change)*
3. Newly constructed fire escapes shall be permitted only where exterior ~~stairs~~ stairways cannot be utilized because of lot lines limiting the ~~stair~~ stairway size or because of the sidewalks, alleys, or roads at grade level.
4. Openings within 10 feet (3048 mm) of fire escape ~~stairs~~ stairways shall be protected by fire assemblies having minimum 3/4-hour fire-resistance ratings.
   Exception: Opening protection shall not be required in buildings equipped throughout with an approved automatic sprinkler system.
5. *(No change)*

IEBC 805.3.1.2.3 Dimensions. ~~Stairs~~ Stairways shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm). Landings at the foot of ~~stairs~~ stairways shall not be less than 40 inches (1016 mm) wide by 36 inches (914 mm) long and located not more than 8 inches (203 mm) below the door.

IEBC 805.4.3 Door closing. In any *work area*, all doors opening onto an exit passageway at grade or an exit ~~stair~~ stairway shall be self-closing or automatic-closing by listed closing devices.

Exceptions:

1. Where exit enclosure is not required by the *International Building Code*.
2. Means of egress within or serving only a tenant space that is entirely outside the *work area*.

IEBC 805.4.3.1 Supplemental requirements for door closing. Where the *work area* exceeds 50 percent of the floor area, doors shall comply with Section 805.4.3 throughout the exit ~~stair~~ stairway from the *work area* to, and including, the level of exit discharge.

IEBC 805.9.1 Minimum requirement. Every required exit stairway that is part of the means of egress for any *work area* and that has three or more risers and is not provided with at least one handrail, or in which the existing handrails are judged to be in danger of collapsing, shall be provided with handrails for the full length of the ~~run of steps~~ stairway on at least one side. All exit stairways with a required egress width of more than 66 inches (1676 mm) shall have handrails on both sides.

IEBC 805.10.1 Minimum requirement. Every open portion of a ~~stair~~ stairway, landing, or balcony that is more than 30 inches (762 mm) above the floor or grade below and is not provided with guards, or those portions in which existing guards are judged to be in danger of collapsing, shall be provided with guards.

IEBC SECTION 806
ACCESSIBILITY

IEBC 806.2 ~~Stairs~~ Stairways and escalators in existing buildings. In *alterations* where an escalator or ~~stair~~ stairway is added where none existed previously, an accessible route shall be provided in accordance with Sections 1104.4 and 1104.5 of the *International Building Code*.

IEBC CHAPTER 9
ALTERATIONS—LEVEL 3

IEBC SECTION 902
SPECIAL USE AND OCCUPANCY

IEBC 902.2.1 Emergency controls. Emergency controls for boilers and furnace equipment shall be provided in accordance with the *International Mechanical Code* in all buildings classified as day nurseries, children's shelter facilities, residential childcare facilities, and similar facilities with children below the age of 21/2 years or that are classified as Group I-2 occupancies, and in group homes, teaching family homes, and supervised transitional living homes in accordance with the following:

1. Emergency shutoff switches for furnaces and boilers in basements shall be located at the top of the ~~stairs~~ stairways leading to the basement; and
2. Emergency shutoff switches for furnaces and boilers in other enclosed rooms shall be located outside of such room.

IEBC CHAPTER 11
ADDITIONS

IEBC SECTION 1102
HEIGHTS AND AREAS

IEBC 1102.2 Area limitations. No *addition* shall increase the area of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 of the *International Building Code* for new buildings unless fire separation as required by the *International Building Code* is provided.

> **Exception:** In-filling of floor openings and nonoccupiable appendages such as elevator and exit ~~stair~~ stairway shafts shall be permitted beyond that permitted by the *International Building Code*.

IEBC CHAPTER 12
HISTORIC BUILDINGS

IEBC SECTION 1203
FIRE SAFETY

IEBC 1203.9 Stairway railings. Grand stairways shall be accepted without complying with the handrail and guard requirements. Existing handrails and guards at all ~~stairs~~ stairways shall be permitted to remain, provided they are not structurally *dangerous*.

IEBC SECTION 1205
CHANGE OF OCCUPANCY

IEBC 1205.11 ~~Stairs~~ Stairways and guards ~~railings.~~ Existing stairways shall comply with the requirements of these provisions. The *code official* shall grant alternatives for stairways and ~~railings~~ guards if alternative stairways are found to be acceptable or are judged to meet the intent of these provisions. Existing stairways shall comply with Section 1203.

> **Exception:** For buildings less than 3,000 square feet (279 m2), existing conditions are permitted to remain at all ~~stairs~~ stairways and ~~rails~~ guards.

IEBC Resource A

2.1 Preliminary evaluation

Exterior Nonbearing Walls: The fire resistance of the exterior walls is important for two reasons. These walls (both bearing and non-bearing) are depended upon to: a) contain a fire within the building of origin; or b) keep an exterior fire *outside* the building. It is therefore important to indicate on the drawings where any openings are located as well as the materials and construction of all doors or shutters. The drawings should indicate the presence of wired glass, its thickness and framing, and identify the materials used for windows and door frames. The protection of openings adjacent to exterior means of escape (e.g., exterior ~~stairs~~ stairways, fire escapes) is particularly important. The ground floor drawing should locate the building on the property and indicate the precise distances to adjacent buildings.

The field investigator should be alert for differences in function as well as in materials and construction details. In general, the details within apartments are not as important as the major exit paths and ~~stairwells~~ exit stairways. The preliminary field investigation should attempt to determine the thickness of all walls. A term introduced below called “thickness design” will depend on an accurate (± 1/4 inch) determination. Even though this initial field survey is called “preliminary,” the data generated should be as accurate and complete as possible.

The field investigator should note the exact location from which observations are recorded. For instance, if a hole is found through a ~~stairwell~~ wall enclosing an exit stairway which allows a cataloguing of the construction details, the field investigation notes should reflect the location of the “find.” At the preliminary stage it is not necessary to core every wall; the interior details of construction can usually be determined at some location.

Doors: Doors to stairways and hallways represent some of the most important fire elements to be considered within a building. The uses of the spaces separated largely controls the level of fire performance necessary. Walls and doors enclosing ~~stairs~~ stairways or elevator shafts would normally require a higher level of performance than between a the bedroom and bath. The various uses are differentiated in Figure 1.

Rule 7: The fire endurance of asymmetrical constructions depends on the direction of heat flow.
This rule is a consequence of Rules 4 and 6 as well as other factors. This rule is useful in determining the relative protection of corridors and ~~stairwells~~ walls enclosing an exit stairway from the surrounding

spaces. In addition, there are often situations where a fire is more likely, or potentially more severe, from one side or the other.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent is for the consistent use of the defined terms for 'stair' and 'stairway' throughout the all the codes. Stair is used when talking about individual steps or stepped aisles. Stairway is used when the provisions are applicable to a series of steps, or flights and landings between stories. In addition, when terms such as 'exit access stairway' and 'exit access ramp' follow each other in a list, consistently eliminate a couple of words by saying 'exit access stairway and ramp.' When the provisions are equally appropriate for ramps and stairways, ramps is added.

Cost Impact: None

E2-12
PART I – INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – INTERNATIONAL FIRE CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – INTERNATIONAL EXISTING BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-STAIRWAY-E-BALDASSARRA-CTC.docx

E3 – 12

202, 405.7.1, 410.6.1, 411.7, [F] 414.7.2, 716.5.3, 1004.3, 1008.1.4.4, 1015, 1018.4, 1028.9 (IFC 5005.4.4, [B]1004.3, [B]1008.1.4.4, [B]1015, [B] 1018.4, [B]1028.9)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

SECTION 202
DEFINITIONS

EXIT ACCESS POINT ~~DOORWAY~~. A ~~door or access~~ point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, exit access ~~stair~~ stairway or exit access ramp.

Revise as follows:

405.7.1 Number of exits. Each floor level shall be provided with no fewer than two exits. Where compartmentation is required by Section 405.4, each compartment shall have no fewer than one exit and shall also have no fewer than one exit access point ~~doorway~~ into the adjoining compartment.

410.6.1 Arrangement. Where two or more exits or exit access points ~~doorways~~ from the stage are required in accordance with Section 1015.1, no fewer than one exit or exit access point ~~doorway~~ shall be provided on each side of a stage.

411.7 Exit marking. Exit signs shall be installed at the required exit or exit access points ~~doorways~~ of amusement buildings in accordance with this section and Section 1011. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved and listed low-level exit signs that comply with Section 1011.5, and directional path markings listed in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.12.2.

[F] 414.7.2 (IFC 5005.4.4) Dispensing, use and handling. Where hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 are transported through corridors, interior exit stairways or ramps, or exit passageways there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720 mm) intervals and at each exit and exit access point ~~doorway~~ throughout the transport route. The signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall initiate a local audible alarm.

716.5.3 Door assemblies in corridors and smoke barriers. Fire door assemblies required to have a minimum fire
protection rating of 20 minutes where located in corridor walls or smoke barrier walls having a fire-resistance rating in accordance with Table 716.5 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).

2. Corridor door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for corridors in multitheater complexes where each motion picture auditorium has at least one-half of its required exit or exit access points ~~doorways~~ opening directly to the exterior or into an exit passageway.
4. Horizontal sliding doors in smoke barriers that comply with Sections 408.3 and 408.8.4 in occupancies in Group I-3.

Revise as follows:

1004.3 (IFC [B] 1004.3) Posting of occupant load. Every room or space that is an assembly occupancy shall have the occupant load of the room or space posted in a conspicuous place, near the main exit or exit access point ~~doorway~~ from the room or space. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or authorized agent.

1008.1.4.4 (IFC [B] 1008.1.4.4) Security grilles. In Groups B, F, M and S, horizontal sliding or vertical security grilles are permitted at the main exit and shall be openable from the inside without the use of a key or special knowledge or effort during periods that the space is occupied. The grilles shall remain secured in the full-open position during the period of occupancy by the general public. Where two or more means of egress are required, not more than one-half of the exits or exit access points ~~doorways~~ shall be equipped with horizontal sliding or vertical security grilles.

SECTION 1015 (IFC [B] 1015)
EXIT AND EXIT ACCESS POINTS ~~DOORWAYS~~

1015.1 (IFC [B] 1015.1) Exits or exit access points ~~doorways~~ from spaces. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.

   Exceptions:

   1. In Group R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. Care suites in Group I-2 occupancies complying with Section 407.4.3.
2. The common path of egress travel exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

TABLE 1015.1 (IFC [B] TABLE 1015.1)
SPACES WITH ONE EXIT OR EXIT ACCESS POINT ~~DOORWAY~~

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E, F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-2, I-3, I-4, R	10
S	29

1015.1.1 (IFC [B] 1015.1.1) Three or more exits or exit access points ~~doorways.~~ Three exits or exit access points ~~doorways~~ shall be provided from any space with an occupant load of 501 to 1,000. Four exits or exit access points ~~doorways~~ shall be provided from any space with an occupant load greater than 1,000.

1015.2 (IFC [B] 1015.2) Exit or exit access point ~~doorway~~ arrangement. Required exits shall be located in a manner that makes their availability obvious. Exits shall be unobstructed at all times. Exit and exit access points ~~doorways~~ shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2.

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access points ~~doorways~~. Where two exits or exit access points ~~doorways~~ are required from any portion of the exit access, the exit doors or exit access points ~~doorways~~ shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access points ~~doorways~~. Interlocking or scissor stairs shall be counted as one exit stairway.

Exceptions:

1. Where interior exit stairways are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access points ~~doorways~~ shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

1015.2.2 (IFC [B] 1015.2.2) Three or more exits or exit access points ~~doorways~~. Where access to three or more exits is required, at least two exit doors or exit access points ~~doorways~~ shall be arranged in accordance with the provisions of Section 1015.2.1.

1015.3 (IFC [B] 1015.3) Boiler, incinerator and furnace rooms. Two exit access points ~~doorways~~ are required in boiler, incinerator and furnace rooms where the area is over 500 square feet (46 m2) and any fuel-fired equipment exceeds 400,000 British thermal units (Btu) (422 000 KJ) input capacity. Where two exit access points ~~doorways~~ are required, one is permitted to be a fixed ladder or an alternating tread device. Exit access points ~~doorways~~ shall be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room.

1015.4 (IFC [B] 1015.4) Refrigeration machinery rooms. Machinery rooms larger than 1,000 square feet (93 m2) shall have not less than two exits or exit access points ~~doorways~~. Where two exit access points ~~doorways~~ are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access points ~~doorways~~ shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access point ~~doorway~~. An increase in travel distance is permitted in accordance with Section 1016.1.

Doors shall swing in the direction of egress travel, regardless of the occupant load served. Doors shall be tight fitting and self-closing.

1015.5 (IFC [B] 1015.5) Refrigerated rooms or spaces. Rooms or spaces having a floor area larger than 1,000 square feet (93 m^2), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two exits or exit access points ~~doorways~~
.

Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an exit or exit access point ~~doorway~~ where such rooms are not protected by an approved automatic sprinkler system. Egress is allowed through adjoining refrigerated rooms or spaces.

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the International Mechanical Code.

1015.6 (IFC [B] 1015.6) Day care means of egress. Day care facilities, rooms or spaces where care is provided for more than 10 children that are 2-1/2 years of age or less, shall have access to not less than two exits or exit access points ~~doorways~~.

1018.4 (IFC [B] 1018.4) Dead ends. Where more than one exit or exit access point ~~doorway~~ is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet (6096 mm) in length.

Exceptions:

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.5), the dead end in a corridor shall not exceed 50 feet (15 240 mm).
2. In occupancies in Groups B, E, F, I-1, M, R-1, R-2, R-4, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet (15 240 mm).
3. A dead-end corridor shall not be limited in length where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor.

1028.9 (IFC [B] 1028.9) Assembly aisles are required. Every occupied portion of any building, room or space used for assembly purposes that contains seats, tables, displays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access points ~~doorways~~ in accordance with this section. Aisle accessways for tables and seating shall comply with Section 1028.10.1.

Reason: The term exit access doorway is a misnomer. By definition, the term exit access doorway includes any access point along the path of egress travel including exit access stairways and ramps. Given the literal nature of the term "doorway," without consulting the definition, most code users would not necessarily associate stairways and ramps when they read the word doorway. This distinction becomes important with the 2012 Edition of the IBC. E5-09/10 introduced the terms "exit access stairway" and "exit access ramp" into Chapter 10. These definitions are particularly significant because the concept of accessing exits at an adjacent story by way of exit access stairways and ramps has been formalized in the 2012 IBC.

There are several requirements that relate to the establishment of these terms. For instance, Section 1015.2 states, "Exit and exit access doorways shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2." It is important that required exits and exit access stairways serving a given story are properly separated. The fact that the requirement refers only to exits and exit access doorways can be misleading. By requiring the separation of exits and exit access points, it is clear to code practitioners that any specified exit access component, whether it be a door, doorway, exit access stairway or exit access ramp, must comply with the provision.

It is not in the best interests of either the design or enforcement communities for the IBC to be misleading through its terminology. It is imperative that the IBC articulate what is intended in the clearest fashion possible. This is particularly important at a time when the IBC means of egress definitions and provisions are being technically and editorially adjusted. Approval of this proposal will increase uniformity in the application of fundamental means of egress provisions.

Cost Impact: None

E3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-Exit access doorway-E-Keith.doc

E4 – 12
202, 1026.3 (IFC [B] 1026.3)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

SECTION 202
DEFINITIONS

EXIT ACCESS RAMP. An ~~interior~~ *ramp* that is not a required *interior* <u>or</u> <u>*exterior*</u> *exit ramp*.

EXIT ACCESS STAIRWAY. An ~~interior~~ *stairway* that is not a required *interior* <u>or</u> <u>*exterior*</u> *exit stairway*.

<u>**EXTERIOR EXIT RAMP.** An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and is open to yards, courts or public ways.</u>

<u>**EXTERIOR EXIT**</u> **STAIRWAY**~~**, EXTERIOR**~~**.** A<u>n exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and is open to</u> ~~that is open on at least one side, except for required structural columns, beams, handrails and guards. The adjoining open areas shall be either~~ yards, courts or public ways. ~~The other sides of the exterior stairway need not be open.~~

INTERIOR EXIT RAMP. An *exit* component that serves to meet one or more *means of egress* design requirements, such as required number of *exits* or *exit access* travel distance, and provides for a protected path of egress travel to the *exit discharge* or *public way.*

INTERIOR EXIT STAIRWAY. An *exit* component that serves to meet one or more *means of egress* design requirements, such as required number of *exits* or *exit access* travel distance, and provides for a protected path of egress travel to the *exit discharge* or *public way.*

RAMP. A walking surface that has a running slope steeper than one unit vertical in 20 units horizontal (5-percent slope).

STAIRWAY. One or more *flights* of *stairs*, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

~~**STAIRWAY, INTERIOR.** A stairway not meeting the definition of an exterior stairway.~~

Revise as follows:

1026.3 (IFC [B] 1026.3) Open side. *Exterior exit stairways* and *ramps* serving as an element of a required *means of egress* shall be open on at least one side<u>, except for required structural columns, beams, handrails and guards</u>. An open side shall have a minimum of 35 square feet (3.3 m^2) of aggregate open area adjacent to each floor level and the level of each intermediate landing. The required open area shall be located not less than 42 inches (1067 mm) above the adjacent floor or landing level.

Reason: Several new means of egress terms were created and defined in the 2012 Edition of the International Building Code. They include, “EXIT ACCESS STAIRWAY,” “EXIT ACCESS RAMP,” “INTERIOR EXIT STAIRWAY” and “INTERIOR EXIT RAMP.” These, and other terms, are fundamental to the design of any means of egress system. There is a precise relationship between these terms. It is proposed to modify the definition of both “EXIT ACCESS STAIRWAY” and “EXIT ACCESS RAMP” by deleting the word “interior.” This is appropriate in that the exit access can be exterior to the building and changes in floor level can occur along the path of egress travel. Since an exit access stairway or ramp can be interior or exterior to the building, it is clarified that they are not exterior exit stairways or ramps as well.

Exterior exit stairways and exterior exit ramps are exit components according to the definition of “EXIT” in Section 202 and Section 1022.1. Both of these terms are currently undefined in the IBC. There is, however, a definition for “STAIRWAY, EXTERIOR.” An exterior stairway is not a means of egress component, per se, in the IBC. It is proposed to replace the definition of “STAIRWAY, EXTERIOR” with a definition for “EXTERIOR EXIT STAIRWAY.” The proposed definition is consistent with the current definition except for the distinction that such stairways are open to yards, courts or public ways consistent with the requirements in Section 1026.4. Additionally, Section 1026.3 has been modified to add technical language formerly contained in the definition of “STAIRWAY, EXTERIOR” as regards in impact of structural columns, beams, handrails and guards on openness determination. A companion definition for exterior exit ramps has been created which is consistent with the proposed definition of exterior exit stairway.

Lastly, it is proposed to delete the current definition of “STAIRWAY, INTERIOR.” This definition is nonsensical, obsolete and out of current technical context. The current definition of "EXIT ACCESS STAIRWAY" effectively replaces this definition.

The definitions of “INTERIOR EXIT RAMP,” “INTERIOR EXIT STAIRWAY.” “RAMP” and “STAIRWAY” have been included for reference purposes so the relationship of the various terms can be seen.

In summary, the proposed modifications to these means of egress component definitions will provide necessary clarity for users who are designing or analyzing a means of egress system. It is imperative that IBC definitions be technically accurate and properly descriptive. Approval of this proposal will allow for more consistent interpretations and applications of important IBC means of egress provisions.

Cost Impact: None

E4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-Exit access doorway-E-Keith.doc

E5 – 12

202, 909.20, 909.20.1, 909.20.2, 909.20.3.1, 909.20.3.2, 909.20.4.1, 909.20.4.4, 909.20.5, 909.20.6, 909.20.6.2, 1022.10.1, 1022.10.2 (IFC [B] 1022.10.1, 1022.10.2)

Proponent: Philip Brazil, P.E., Senior Engineer, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee

Revise as follows:

SECTION 202
DEFINITIONS

SMOKEPROOF ENCLOSURE. An *exit stairway* or *ramp* designed and constructed so that the movement of the products of combustion produced by a fire occurring in any part of the building into the enclosure is limited.

Revise as follows:

SECTION 909
SMOKE CONTROL SYSTEMS

909.20 Smokeproof enclosures. Where required by Section 1022.10, a *smokeproof enclosure* shall be constructed in accordance with this section. A *smokeproof enclosure* shall consist of an enclosed *interior exit stairway* or *ramp* that conforms to Section 1022.2 and an open exterior balcony or ventilated vestibule meeting the requirements of this section. Where access to the roof is required by the *International Fire Code*, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

909.20.1 Access. Access to the ~~stair~~ *stairway* or *ramp* shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall not be less than the required width of the *corridor* leading to the vestibule but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings are not permitted other than the required *means of egress* doors. The vestibule shall be separated from the *stairway* or *ramp* by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The open exterior balcony shall be constructed in accordance with the *fire-resistance rating* requirements for floor assemblies.

909.20.3.1 Balcony doors. Where access to the *stairway* or *ramp* is by way of an open exterior balcony, the door assembly into the enclosure shall be a *fire door assembly* in accordance with Section 716.5.

909.20.3.2 Vestibule doors. Where access to the *stairway* or *ramp* is by way of a vestibule, the door assembly into the vestibule shall be a *fire door assembly* complying with Section 715.4. The door assembly from the vestibule to the *stairway* or *ramp* shall have not less than a 20-minute *fire protection rating* complying with Section 716.5.

909.20.4.1 Vestibule doors. The door assembly from the *building* into the vestibule shall be a *fire door assembly* complying with Section 716.5.3. The door assembly from the vestibule to the *stairway* or *ramp* shall have not less than a 20-minute *fire protection rating* and meet the requirements for a smoke door assembly in accordance with Section 716.5.3. The door shall be installed in accordance with NFPA 105.

909.20.4.4 Stair shaft air movement system. The ~~*stair*~~ *stairway* or *ramp* shaft shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the shaft relative to the vestibule with all doors closed.

909.20.5 ~~Stair~~ Stairway and ramp pressurization alternative. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided ~~that~~ each interior *exit stairway* or *ramp* ~~are~~ is pressurized to a minimum of 0.10 inches of water (25 Pa) and a maximum of 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all *stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect.

909.20.6 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the ~~*stair*~~ *stairway* and ramp shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.6.2 Standby power. Mechanical vestibule and ~~*stair*~~ *stairway* and ramp shaft ventilation systems and automatic fire detection systems shall be powered by an *approved* standby power system conforming to Section 403.4.8 and Chapter 27.

Revise as follows:

SECTION 1022 (IFC [B] 1022)
INTERIOR EXIT STAIRWAYS AND RAMPS

1022.10.1 (IFC [B] 1022.10.1) Termination and extension. A *smokeproof enclosure* or pressurized *stairway* or *ramp* shall terminate at an *exit discharge* or a *public way*. The *smokeproof enclosure* or pressurized *stairway* or *ramp* shall be permitted to be extended by an *exit passageway* in accordance with Section 1022.3. The *exit passageway* shall be without openings other than the *fire door assembly* required by Section 1022.3.1 and those necessary for egress from the *exit passageway*. The *exit passageway* shall be separated from the remainder of the building by 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Exceptions:

1. Openings in the *exit passageway* serving a *smokeproof enclosure* are permitted where the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*, and openings are protected as required for access from other floors.
2. Openings in the *exit passageway* serving a pressurized *stairway* or *ramp* are permitted where the *exit passageway* is protected and pressurized in the same manner as the pressurized *stairway* or *ramp*.
3. The *fire barrier* separating the smokeproof enclosure or pressurized *stairway* or *ramp* from the *exit passageway* is not required, provided the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure* or pressurized *stairway* or *ramp*.
4. A *smokeproof enclosure* or pressurized *stairway* or *ramp* shall be permitted to egress through areas on the *level of exit discharge* or vestibules as permitted by Section 1027.

1022.10.2 (IFC [B] 1022.10.2) Enclosure access. Access to the *stairway* or *ramp* within a *smokeproof enclosure* shall be by way of a vestibule or an open exterior balcony.

Exception: Access is not required by way of a vestibule or exterior balcony for *stairways* and *ramps* using the pressurization alternative complying with Section 909.20.5.

Reason: The addition of "ramp(s)" is for consistency with the language in Section 1022.10 (smokeproof enclosures and pressurized stairways and ramps), which requires interior exit stairways and ramps to be smokeproof enclosures or pressurized stairways or ramps in accordance with Section 909.20 where required by Section 403.5.4 (smokeproof enclosures in high-rise buildings) or 405.7.2 (smokeproof enclosures in underground buildings). In Sections 909.20.1, 909.20.4.4, 909.20.6 and 909.20.6.2, the change from "stair" to "stairway" is for consistency with the use of "stairway" elsewhere in Section 909.20. Based on our analysis of the 2012 IBC, all instances of "exit stairway" in provisions for or related to smokeproof enclosures, where the addition of "ramp" is warranted, are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

E5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

909.20-E-Brazil.doc

E6 – 12
202

Proponent: Gene Boecker, Code Consultants, Inc., representing self

Revise as follows:

202
DEFINITIONS

STAIR. A change in elevation, consisting of one or more ~~risers~~ steps providing occupant passage from one level to another.

STAIRWAY. One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage ~~from one level to another~~.

Reason: The intent is not to change the application of the terms Stair and Stairway but to use more common, consistent language and eliminate a circular definition, as it exists for "stair."

Stair: The term riser is deleted because it is not defined. To determine what a riser is, it is necessary to look in Section 1009 on Stairways. This is confusing because a "riser" is used to define a stair, but a riser doesn't exist unless it is associated with is a stair. Using "riser" in the definition is circular and ambiguous. The term "step" is used because it is more common and easier to understand. Whereas a riser, to be considered a code complying element, must meet certain criteria, a step is simply a change in the elevation. The term "step" is commonly used in various dictionaries in the definition of "stair," so it is common language usage.

It also eliminates the conflict with "risers" upon which people stand in theatrical performances and are connected by steps. A riser as used in theatrical performances is a change in elevation but is not used for occupant passage between levels. The code's usage of riser should be left to its specific application.

Throughout the IBC, the word "step" is used 51 times. Of those, 30 times it is in association with the type of element addressed. In the other 21 times, it is associated with other changes in elevation such as stepped footings. Hence, it is consistent with the concept of changed levels. The phrase "providing occupant passage" is added to provide distinction from these other types of steps. A stair does not include stepped footings because a stepped footing is not used for occupant passage.

Stairway: Because a stair exists within a stairway by definition, it is not necessary to repeat the phrase "passage from one level to another." That is included in the concept with the revised definition for "stair." Since a stairway includes the landings and platforms in addition to the stair, those must be included. As used in the stairway definition, the term "passage" is used differently so it should remain.

Cost Impact: None

E6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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E7-12/13

202, 403.5.1, 505.2.3, 707.3.3, 707.5.1, 707.7.1, 711.4, 712.1.8, 712.1.12, 713.1, 1001.2, 1007.2, 1007.3, 1007.6.2, 1009.2-1009.3.1.8, 1010.2, 1011.1, 1015.1, 1015.2, 1015.2.1, 1015.2.1.1(new), 1015.2.2, 1015.2.3(new), 1015.2.3.1(new), 1016.3, 1018(new), 1026.6, 1027.1, 1028.5 (IFC [B] 1001.2, 1007.2, 1007.3, 1007.6.2, 1009.2-1009.3.1.8, 1010.2, 1011.1, 1015.1, 1015.2, 1015.2.1, 1015.2.1.1(new), 1015.2.2, 1015.2.3(new), 1015.2.3.1(new), 1016.3, 1018(new), 1026.6, 1027.1, 1028.5)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 202
DEFINITIONS

EXIT ACCESS RAMP. An ~~interior~~ *ramp* that is not a required ~~*interior*~~ *exit ramp*.

EXIT ACCESS STAIRWAY. An ~~interior~~ *stairway* that is not a required ~~*interior*~~ *exit stairway*.

Revise as follows:

SECTION 1001
ADMINISTRATION

1001.2 (IFC [B] 1001.2) Minimum requirements. It shall be unlawful to alter a building or structure in a manner that will reduce the number of exits or the capacity of the means of egress to less than required by this code. <u>Means of egress shall be designed to be continuous and unobstructed</u>.

SECTION 1007 (IFC [B] 1007)
ACCESSIBLE MEANS OF EGRESS

1007.2 (IFC [B] 1007.2) Continuity and components. Each required *accessible means of egress* shall be continuous to a *public way* and shall consist of one or more of the following components:

1. *Accessible* routes complying with Section 1104.
2. *Interior exit stairways* complying with Sections 1007.3 and 1022.
3. ~~Interior~~ *exit access stairways* complying with Sections 1007.3 and ~~1009.3~~ <u>1018.2 or 1018.3</u>.
4. Exterior *exit stairways* complying with Sections 1007.3 and 1026 and serving levels other than the *level of exit discharge*.
5. Elevators complying with Section 1007.4.
6. Platform lifts complying with Section 1007.5.
7. *Horizontal exits* complying with Section 1025.
8. *Ramps* complying with Section 1010.
9. *Areas of refuge* complying with Section 1007.6.
10. Exterior area for assisted rescue complying with Section 1007.7.

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an *accessible means of egress*, a *stairway* between stories shall have a clear width of 48 inches (1219 mm) minimum between *handrails* and shall either incorporate an *area of refuge* within an enlarged floor-level landing or shall be accessed from either an *area of refuge* complying with Section 1007.6 or a *horizontal exit*. *Exit access stairways* that connect levels in the same story are not permitted as part of an *accessible means of egress*.

Exceptions:

1. Exit access stairways providing means of egress from mezzanines are permitted as part of an accessible means of egress.
2~~1~~. The clear width of 48 inches (1219 mm) between *handrails* is not required in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3~~2~~. *Areas of refuge* are not required at *stairways* in buildings equipped throughout by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4~~3~~. The clear width of 48 inches (1219 mm) between *handrails* is not required for *stairways* accessed from a *horizontal exit*.
5~~4~~. *Areas of refuge* are not required at *stairways* serving *open parking garages*.
6~~5~~. *Areas of refuge* are not required for smoke protected seating areas complying with Section 1028.6.2.
7~~6~~. The *areas of refuge* are not required in Group R-2 occupancies.

1007.6.2 (IFC [B] 1007.6.2) Separation. Each *area of refuge* shall be separated from the remainder of the story by a *smoke barrier* complying with Section 709 or a *horizontal exit* complying with Section 1025. Each *area of refuge* shall be designed to minimize the intrusion of smoke.

Exception: *Areas of refuge* located within an enclosure for ~~*exit access stairways* or~~ *interior exit stairways*.

SECTION 1009 (IFC [B] 1009)
STAIRWAYS

1009.1 (IFC [B] 1009.1) General. Stairways serving occupied portions of a building shall comply with the requirements of this section.

~~**1009.2 (IFC [B] 1009.2) Interior exit stairways.** Interior exit stairways shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1.~~

~~**1009.2.1 (IFC [B] 1009.2.1) Where required.** Interior exit stairways shall be included, as necessary, to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance.~~

~~**1009.2.2 (IFC [B] 1009.2.2) Enclosure.** All interior exit stairways shall be enclosed in accordance with the provisions of Section 1022.~~

~~**1009.3 (IFC [B] 1009.3) Exit access stairways.**~~ *Relocated to 1018.3*

~~**1009.3.1 (IFC [B] 1009.3.1) Construction.** Where required, enclosures for exit access stairways shall be constructed in accordance with this section. Exit access stairway enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 711, or both.~~

~~**1009.3.1.1 (IFC [B] 1009.3.1.1) Materials.** Exit access stairway enclosures shall be of materials permitted by the building type of construction.~~

~~**1009.3.1.2 (IFC [B] 1009.3.1.2) Fire-resistance rating.** Exit access stairway enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit access stairway enclosures shall include any basements, but not any mezzanines. Exit access stairway enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.~~

~~**1009.3.1.3 (IFC [B] 1009.3.1.3) Continuity.** Exit access stairway enclosures shall have continuity in~~

~~accordance with Section 707.5 for fire barriers or Section 711.4 for horizontal assemblies as applicable.~~

~~**1009.3.1.4 (IFC [B] 1009.3.1.4) Openings.** Openings in an exit access stairway enclosure shall be protected in accordance with Section 716 as required for fire barriers. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~

~~**1009.3.1.4.1 (IFC [B] 1009.3.1.4.1) Prohibited openings.** Openings other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.~~

~~**1009.3.1.5 (IFC [B] 1009.3.1.5) Penetrations.** Penetrations in an exit access stairway enclosure shall be protected in accordance with Section 714 as required for fire barriers.~~

~~**1009.3.1.5.1 (IFC [B] 1009.3.1.5.1) Prohibited penetrations.** Penetrations other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.~~

~~**1009.3.1.6 (IFC [B] 1009.3.1.6) Joints.** Joints in an exit access stairway enclosure shall comply with Section 715.~~

~~**1009.3.1.7 (IFC [B] 1009.3.1.7) Ducts and air transfer openings.** Penetrations of an exit access stairway enclosure by ducts and air transfer openings shall comply with Section 717.~~

~~**1009.3.1.8 (IFC [B] 1009.3.1.8) Exterior walls.** Where exterior walls serve as a part of an exit access stairway enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.~~

(Renumber remaining sections)

SECTION 1010
RAMPS

~~**1010.2 (IFC [B] 1010.2) Enclosure.** All interior exit ramps shall be enclosed in accordance with the applicable provisions of Section 1022. Exit access ramps shall be enclosed in accordance with the provisions of Section 1009.3 for enclosure of stairways.~~

(Renumber remaining sections)

SECTION 1011 (IFC [B] 1011)
EXIT SIGNS

1011.1 (IFC [B] 1011.1) Where required. *Exits* ~~and *exit access* doors~~ shall be marked by an *approved exit* sign readily visible from any direction of egress travel. The path of egress travel to *exits* and within *exits* shall be marked by readily visible *exit* signs to clearly indicate the direction of egress travel in cases where the *exit* or the path of egress travel is not immediately visible to the occupants. Intervening *means of egress* doors within *exits* shall be marked by *exit* signs. *Exit* sign placement shall be such that no point in an *exit access corridor* or *exit passageway* is more than 100 feet (30 480 mm) or the *listed* viewing distance for the sign, whichever is less, from the nearest visible *exit* sign.

Exceptions:

1. *Exit* signs are not required in rooms or areas that require only one *exit* or *exit access*.
2. Main exterior *exit* doors or gates that are obviously and clearly identifiable as *exits* need not have *exit* signs where *approved* by the *building official*.
3. *Exit* signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2 or R-3.

4. *Exit* signs are not required in dayrooms, sleeping rooms or dormitories in occupancies in Group I-3.
5. In occupancies in Groups A-4 and A-5, *exit* signs are not required on the seating side of vomitories or openings into seating areas where *exit* signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

SECTION 1015 (IFC [B] 1015)
EXITS AND EXIT ACCESS DOORWAYS

1015.1 (IFC [B] 1015.1) Exits or exit access doorways from spaces. Two exits or exit access doorways from any space including mezzanines shall be provided where one of the following conditions exists:

1. The *occupant load* of the space exceeds one of the values in Table 1015.1.

   Exceptions:

   1. In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. Care suites in Group I-2 occupancies complying with Section 407.4.3.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

1015.2 (IFC [B] 1015.2) Exit or exit access doorway arrangement. Required exits shall be located in a manner that makes their availability obvious. ~~Exits shall be unobstructed at all times.~~ Exits, ~~and~~ exit access doorways, and exit access stairways and ramps shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2.

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways. Where two *exits* or *exit access doorways* and exit access stairways and ramps are required from any portion of the *exit access*, the *exit* ~~doors~~ or *exit access doorways* and exit access stairways and ramps shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between *exit* ~~doors~~ or *exit access doorways* and exit access stairways and ramps. Interlocking or *scissor stairs* shall be counted as one *exit stairway*.

Exceptions:

1. Where interior exit stairways are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the *exit* ~~doors~~ or *exit access doorways* and exit access stairways and ramps shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

1015.2.1.1 (IFC [B] 1015.2.1.1) Measurement point. The separation distance required in Section 1015.2.1 shall be measured in accordance with the following:

1. The separation distance to exit or exit access doorways shall be measured to any point along the width of the doorway.
2. The separation distance to exit access stairways shall be measured to the closest riser.
3. The separation distance to exit access ramps shall be measured to the start of the ramp run.

1015.2.2 (IFC [B] 1015.2.2) Three or more exits or exit access doorways. Where access to three or more *exits* is required, at least two *exit* ~~doors or~~ *exit access doorways* shall be arranged in accordance with the provisions of Section 1015.2.1.

1015.2.3 (IFC [B] 1015.2.3) Remoteness of exit access stairways or ramps. Where two exit access stairways or ramps provide the required means of egress to exits at another story, the required separation distance shall be maintained for all portions of such exit access stairways or ramps.

1015.2.3.1 (IFC [B] 1015.2.3.1) Three or more exit access stairways or ramps. Where more than two exit access stairways or ramps provide the required means of egress, at least two shall be arranged in accordance with 1015.2.3.

SECTION 1016 (IFC [B] 1016)
EXIT ACCESS TRAVEL DISTANCE

1016.3 (IFC [B] 1016.3) Measurement. Exit access travel distance shall be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit.

~~**Exceptions**~~ **Exception**:

~~1.~~ In open parking garages, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.

~~2. In outdoor facilities with open exit access components, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.~~

SECTION 1018 (IFC [B] 1018)
EXIT ACCESS STAIRWAYS AND RAMPS

1018.1 (IFC [B] 1018.1) General. Exit access stairways and ramps serving as an exit access component in a means of egress system shall comply with the requirements of this section. The number of stories connected by exit access stairways and ramps shall include basements, but not mezzanines.

1018.2 (IFC [B] 1018.2) All occupancies. Exit access stairways and ramps that serve floor levels within a single story are not required to be enclosed.

1018.3 (IFC [B] 1018.3) ~~1009.3(IFC [B] 1009.3)~~ Occupancies other than Group I-2 and I-3. ~~Exit access stairways.~~ ~~Floor openings between stories created by exit access stairways shall be enclosed.~~ In other than Group I-2 and I-3 occupancies, floor openings containing exit access stairways or ramps that do not comply with one of the conditions listed in this section shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

~~**Exceptions:**~~

1. ~~In other than Group I-2 and I-3 occupancies,~~ Exit access stairways and ramps that serve, or atmospherically communicate between, only two stories~~, are not required to be enclosed~~. Such interconnected stories shall not be open to other stories.
2. In Group R-1, R-2 or R-3 occupancies, exit access stairways and ramps connecting four stories or less serving and contained within ~~a single residential~~ an individual dwelling unit or

sleeping unit or live/work unit ~~in Group R-1, R-2 or R-3~~ ~~occupancies~~ ~~are not required to be enclosed~~.

3. ~~In buildings with only Group B or M occupancies,~~ Exit access stairways and ramps in ~~openings are not required to be enclosed provided that the~~ buildings ~~is~~ equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the ~~floor~~ vertical opening between stories does not exceed twice the horizontal projected area of the ~~exit access~~ stairway or ramp, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M occupancies, this provision is limited to openings that do not connect more than four stories.
4. ~~In other than Groups B and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.~~

4~~5~~. Exit access stairways and ramps within an atrium complying with the provisions of Section 404 ~~are not required to be enclosed~~.

5~~6~~. Exit access stairways and ramps in open parking garages that serve only the parking garage ~~are not required to be enclosed~~.

6~~7~~. Exit access stairways and ramps serving ~~outdoor facilities where all portions of the means of egress are essentially open to the outside are not required to be enclosed~~ open-air seating complying with the exit access travel distance requirements of Section 1028.7.

~~8. Exit access stairways serving stages, platforms and technical production areas in accordance with Sections 410.6.2 and 410.6.3 are not required to be enclosed.~~

7~~9~~. Exit access stairways and ramps serving ~~are permitted to be open between~~ the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.

~~10. In Group I-3 occupancies, exit access stairways constructed in accordance with Section 408.5 are not required to be enclosed.~~

1018.4 (IFC [B] 1018.4) Group I-2 and I-3 occupancies. In Group I-2 and I-3 occupancies, floor openings between stories containing exit access stairways or ramps are required to be enclosed with a shaft enclosure constructed in accordance with Section 713.

Exception: In Group I-3 occupancies, exit access stairways or ramps constructed in accordance with Section 408 are not required to be enclosed.

(Renumber Subsequent Sections)

SECTION 1026 (IFC [B] 1026) EXTERIOR EXIT STAIRWAYS AND RAMPS

1026.6 (IFC [B] 1026.6) Exterior stairway and ramp protection. *Exterior exit stairways* and *ramps* shall be separated from the interior of the building as required in Section 1022.2. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above *grade plane* where a *level of exit discharge* serving such occupancies is the first story above *grade plane*.
2. Separation from the interior of the building is not required where the *exterior exit stairway* or *ramp* is served by an exterior *ramp* or balcony that connects two remote *exterior stairways* or other *approved exits* with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.

3. ~~Separation from the interior of the building is not required for an *exterior stairway* or *ramp* located in a building or structure that is permitted to have unenclosed *exit access stairways* in accordance with Section 1009.3~~.
~~4.~~ Separation from the interior of the building is not required for *exterior* exit *stairways* or *ramps* connected to open-ended *corridors*, provided that Items 3.1 ~~4.1~~ through 3.5 ~~4.5~~ are met:
    - ~~4.1~~3.1. The building, including *corridors*, *stairways* or *ramps*, shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
    - ~~4.2~~3.2. The open-ended *corridors* comply with Section 1018.
    - ~~4.3~~3.3. The open-ended *corridors* are connected on each end to an *exterior exit stairway* or *ramp* complying with Section 1026.
    - ~~4.4~~3.4. The *exterior walls* and openings adjacent to the *exterior exit stairway* or *ramp* comply with Section 1022.7.
    - ~~4.5~~3.5. At any location in an open-ended *corridor* where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m2) or an *exterior stairway* or *ramp* shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

SECTION 1027 (IFC [B] 1027)
EXIT DISCHARGE

1027.1 (IFC [B] 1027.1) General. *Exits* shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide direct access to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 below shall not exceed 50 percent of the number and capacity of the required exits.

Exceptions:

1. A maximum of 50 percent of the number and capacity of *interior exit stairways* and *ramps* is permitted to egress through areas on the *level of exit discharge* provided all of the following are met:
    - 1.1 ~~Such~~ Discharge of interior exit stairways and ramps shall be provided with ~~enclosures egress to~~ a free and unobstructed path of travel to an exterior *exit* door and such *exit* is readily visible and identifiable from the point of termination of the enclosure.
    - 1.2 The entire area of the *level of exit discharge* is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.
    - 1.3 The egress path from the *interior exit stairway* and *ramp* on the *level of exit discharge* is protected throughout by an *approved automatic sprinkler system*. All portions of the *level of exit discharge* with access to the egress path shall either be protected throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of *interior exit stairways* or *ramps*.
    - 1.4 Where a required interior exit stairway or ramp and an exit access stairway or ramp serve the same floor level and terminate at the same level of exit discharge, the termination of the exit access stairway or ramp and the exit discharge door of the interior exit stairway or ramp shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the exit discharge door from the interior exit stairway or ramp and the last tread of the exit access stairway or termination of slope of the exit access ramp.
2. A maximum of 50 percent of the number and capacity of the *interior exit stairways* and *ramps* is permitted to egress through a vestibule provided all of the following are met:
    - 2.1 The entire area of the vestibule is separated from areas below by construction conforming to the *fire-resistance rating* ~~for~~ of the interior exit stairway or ramp enclosure.

2.2 The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

2.3 The area is separated from the remainder of the *level of exit discharge* by construction providing protection at least the equivalent of *approved* wired glass in steel frames.

2.4 The area is used only for *means of egress* and *exits* directly to the outside.

3. *Horizontal exits* complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

SECTION 1028 (IFC [B] 1028)
ASSEMBLY

1028.5 (IFC [B] 1028.5) Interior balcony and gallery means of egress. For balconies, galleries or press boxes having a seating capacity of 50 or more located in a building, room or space used for assembly purposes, at least two means of egress shall be provided, with one from each side of every balcony, gallery or press box ~~and at least one leading directly to an exit.~~

Revise as follows:

SECTION 403
HIGH-RISE BUILDINGS

403.5.1 Remoteness of interior exit stairways. Required *interior exit stairways* shall be separated by a distance not less than 30 feet (9144 mm) or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the <u>enclosure surrounding the</u> *interior exit stairways*. In buildings with three or more *interior exit stairways,* no fewer than two of the *interior exit stairways* shall comply with this section. Interlocking or *scissor stairs* shall be counted as one *interior exit stairway.*

Revise as follows:

SECTION 505
MEZZANINES AND EQUIPMENT PLATFORMS

505.2.3 Openness. A *mezzanine* shall be open and unobstructed to the room in which such *mezzanine* is located except for walls not more than 42 inches (1067 mm) in height, columns and posts.

Exceptions:

1. *Mezzanines* or portions thereof are not required to be open to the room in which the *mezzanines* are located, provided that the *occupant load* of the aggregate area of the enclosed space is not greater than 10.
2. A *mezzanine* having two or more ~~*means of egress*~~ <u>exits or access to exits</u> is not required to be open to the room in which the *mezzanine* is located~~ if at least one of the *means of egress* provides direct access to an *exit* from the *mezzanine* level.~~
3. *Mezzanines* or portions thereof are not required to be open to the room in which the *mezzanines* are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the *mezzanine* area.
4. In industrial facilities, *mezzanines* used for control equipment are permitted to be glazed on all sides.
5. In occupancies other than Groups H and I, that are no more than two *stories* above *grade plane* and equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, a *mezzanine* having two or more *means of egress* shall not be required to be open to the room in which the *mezzanine* is located.

Revise as follows:

SECTION 707
FIRE BARRIERS

707.3.3 Enclosures for exit access stairways. The *fireresistance rating* of the fire barrier separating building areas from an exit access stairway or ramp shall comply with Section ~~1009.3.1.2~~ 713.4.

707.5.1 Supporting construction. The supporting construction for a *fire barrier* shall be protected to afford the required *fire-resistance rating* of the *fire barrier* supported. Hollow vertical spaces within a *fire barrier* shall be fireblocked in accordance with Section 718.2 at every floor level.

Exceptions:

1. The maximum required *fire-resistance rating* for assemblies supporting *fire barriers* separating tank storage as provided for in Section 415.8.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
3. Supporting construction for 1-hour *fire barriers* required by Table 509 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.
4. Interior exit stairway and ramp enclosures required by Section 1022.2 and exit access stairway and ramp enclosures required by ~~Section~~ ~~1009.3~~ Sections 1018.3 and 1018.4 shall be permitted to terminate at a top enclosure complying with Section 713.12.

707.7.1 Prohibited penetrations. Penetrations into enclosures for ~~exit access stairways, exit access ramps~~, interior exit stairways~~, interior exit~~ and ramps or an exit passageway shall be allowed only ~~when~~ where permitted by Section ~~1009.3.1.5,~~ 1022.5 or 1023.6~~, respectively~~.

SECTION 711
HORIZONTAL ASSEMBLIES

711.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 712.1, 714.4, 715, ~~1009.3~~ 1018 and 1022.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 705.8.6. The supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the *horizontal assembly* is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 509, provided the required *fire-resistance rating* does not exceed 1 hour.
2. Horizontal assemblies at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.
3. Horizontal assemblies at *smoke barriers* constructed in accordance with Section 709.

SECTION 712
VERTICAL OPENINGS

712.1 General. The provisions of this section shall apply to the vertical opening applications listed in Sections 712.1.1through 712.1.18.

712.1.1 Shaft enclosures. Vertical openings contained entirely within a shaft enclosure complying with Section 713 shall be permitted.

712.1.8 Two story openings. In other than Groups I-2 and I-3, a floor opening that is not used as one of the application listed in this section shall be permitted if it complies with all the items below.

1. Does not connect more than two stories.
~~2. Does not contain a stairway or ramp required by Chapter 10.~~
2~~3.~~ Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
3~~4.~~ Is not concealed within the construction of a wall or a floor/ceiling assembly.
4~~5.~~ Is not open to a corridor in Group I and R occupancies.
5~~6.~~ Is not open to a corridor on nonsprinklered floors.
6~~7.~~ Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

712.1.12 ~~Unenclosed~~ Exit access stairways and ramps. Vertical floor openings ~~created by~~ ~~unenclosed~~ containing exit access stairways or ramps in accordance with ~~Sections 1009.2 and 1009.3~~ Section 1018 shall be permitted.

SECTION 713
SHAFT ENCLOSURES

713.1 General. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. ~~Exit access stairways and exit access ramps shall be protected in accordance with the applicable provisions of Section 1009.~~ Interior exit stairways and ~~interior exit~~ ramps shall be protected in accordance with the requirements of Section 1022.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The most substantial part of this change is the relocation of exit access specific stair requirements from the general stair section 1009 to a stand alone section 1018. Another substantial purpose of this code change proposal is for coordination between the open stairway code change from this committee for the last cycle (E5-09/10) and other changes that occurred during the same cycle. In addition, there were areas that needed to be clarified as part of coordination. The CTC also reviewed the concerns raised in the E5 09/10 Public Comments and addressed some outstanding issues from the public comments. Below are the specific reason statements for each section proposed for change:

202 (and 1026.6 exception #3)-The word "interior" was deleted from the definition of exit access stairway and ramp. Generally, this is done because there is no need to restrict exit access to interior elements. Specifically, this was done in coordination with the proposed deletion of exception #3 to section 1026.6. Exception #3 was a holdover from when what are currently exit access stairs were exit stairs. Exception #3 was there to coordinate the allowance for an exterior exit stair to be unprotected when an interior exit stair would be allowed to be unprotected. E5 changed the unenclosed exit stair to an exit access stair. In keeping with that methodology this exception is being deleted and "interior" is being removed from the exit access stair and ramp definitions so that the provisions that allow an unenclosed exit access stair are equally applicable to interior or exterior stairways. Rather than use exception #3 to 1026.6 for a exterior stair without protection the exit access provisions would be used for the exterior stair.

1001.2 – The new sentence in 1001.2 was a requirement in two sentences in 1015.2 that is proposed to be relocated here as it is a more general requirement. This was done as part of some additional proposed revisions to section 1015.2 that will be explained below in section order.

1007.2 -This is another coordination change related to the relocation of the access stair provisions from 1009.3 to 1018.

1007.3 – The last sentence of the main paragraph states that exit access stairways connecting levels in the same story are not permitted as part of an accessible means of egress. While this is true for split level floors or stepped aisles, this should not be true for mezzanines. While they are considered part of the floor below for height and area requirements, mezzanines are required to be elevated over 7'-0" (Section 505.2) similar to a story change in level.

1007.6.2-The exception should only apply to exit stairways based on mandatory enclosure requirements for exit stairways. Exit access stairs may be open or enclosed with non-rated “enclosures” therefore the requirement needs to be clear that separation of areas of refuge serving exit access stairways must comply with 1007.6.2.

1009.2, 1009.3 and subsections– This proposed change will remove the specific requirements for exit access stairways for the general stairway section 1009. 1009 will remain a general stair design section for all stairway details that are not means of egress system specific such as tread and riser dimensions, headroom, widths, etc. The specific enclosure requirements regarding exit access stairs are proposed to be addressed in a new stand alone section, 1018. This is in keeping with the same organization already in chapter 10 for the specific protection requirements for interior exit stairways and ramps and exterior exit stairways and ramps, as well as exit passageways and horizontal exits, each having a dedicated section that addresses the specific protection requirements for each means of egress element. The idea is to separate the general requirements from the specific requirements with regards to each type of MOE element.

1009.3.1 through 1009.3.1.8 – These sections explain how to construct a rated shaft enclosure around an exit access stair when a fire rating is required based on floor penetration limits being exceeded to prevent vertical smoke and heat migration. They were deleted entirely and not relocated to 1018 because the new sections 1018.3 and 1018.4 are proposed to reference to Section 713 for floor opening enclosure construction requirements. The original concept in E5 09/10 was to repeat the shaft enclosure requirements in the exit access stair section as exit access stair enclosure construction requirements. It was decided that this added unneeded text to the code and because it was a duplicate of requirements based on 713 that a change to one section may not be made to the companion section and therefore has the potential to set up an inconsistency with the two code sections that are intended to be the same.

1010.2 – This section is proposed to be deleted because it is not necessary. Just as 1009 is the general requirements for stairs 1010 is the general requirements for ramps. The specific requirements are addressed in stand alone sections that do not need to be cross referenced from the general section or vise versa.

1011.1 – “Exit access doors” is proposed for deletion in the first sentence because marking the path of egress travel is addressed in the remainder of section and exit access doors are part of the path of egress travel.

1015.1 – Revised to include mezzanines to clarify a mezzanine is a space, not a story, for purposes of means of egress. This also clarifies the 2012 IBC revision to Section 505 where mezzanines now reference Chapter 10 for means of egress. 505.3 Egress was deleted from the 2009 edition and replaced with 505.2.2, which is just a reference to chapter 10.

1015.2 –The second sentence was moved to 1001.1 because it is a more general requirement. Exit access stairways and ramps is proposed to be added to the third sentence because by definition an exit access doorway is a point where a path of travel enters an unenclosed exit access stairway but not the stairway itself. Therefore, current code text will allow exit access stairs to diverge towards each other reducing the distance between the stairways to less than the minimum separation. This is the beginning of a few changes to section 1015 that will prohibit diverging exit access stairs to less than the required separation distance for exit access doorways. Further modifications detailed below detail arrangement of exit access stairways in addition to exit access doorways, therefore, the elements were added to 1015.2 for consistency with the next proposed changes to 1015.2.1 and 1015.2.2.

1015.2.1 and 1015.2.2- In three places the word “doors” was deleted after “exit” because exit stands on its own and does not need to specifically reference and exit door.

1015.2.1.1– When exit access stairs are used the point where the path of travel enters the stairway is by definition an “exit access doorway”. There is concern that there will be confusion regarding how to measure the distance between “exit access doorways” when unenclosed exit access stairways are used. The three measurement methods are proposed to be added to clearly state how to measure between doors, stairways and ramps when they need to meet separation requirements per section 1015.

1015.2.3 and 1015.2.3.1-This proposed section and sub-section are intended to require that the minimum separation distances between exit access stairways and ramps be maintain for the entire length of travel on the stairway or ramp. This is to prohibit stair and ramp runs that meet separation distance requirements at the first riser or beginning slope, from converging towards another stair or ramp such that the separation is reduced as the occupant goes up or down the stair or ramp run. Exit access stairs and ramps should maintain the required distance, just as doors, until egress travel over the ramp or stair is completed.

1016.3 – This is a companion change to 1018.3 exception #6 (pervious #7 to 1009.2.2) detailed below regarding outdoor facilities. The exception to 1018.3 was changed to match the requirements for open air seating as regulated by section 10128.7, which allows unlimited travel distance in non-combustible construction that has open air seating and 400 feet in combustible construction. This change deletes the measurement of the travel distance to the closest riser in outdoor facilities and replaces it with the 400 foot or unlimited travel distance per 1028.7. The intent is to coordinate the various travel distance requirements regarding open air seating facilities.

New Section 1018 Exit access stairways and ramps-
Current section 1009.3 is proposed to be relocated to new section 1018. This is the most significant aspect of this code change proposal. This part of the proposed change creates a new stand alone code section for exit access stairway and ramp specific requirements so that the specific requirements for exit access stairs are separate from the general requirements. This is in keeping with the same organization already in chapter 10 for the specific protection requirements for interior exit stairways and ramps and exterior exit stairways and ramps, as well as exit passageways and horizontal exits, each having a dedicated section that addresses the specific protection requirements for each means of egress element. The specific enclosure requirements regarding exit access

stairs are proposed to be addressed in the new section, 1018. 1009 will remain a general stair design section for all stairway details that are not means of egress system specific such as tread and riser dimensions, headroom, widths, etc.

New 1018.1 – This is just a general scoping section. The statement that stories include basements but not mezzanines was included in this section.

New 1018.2 - This section clarifies that steps/ramps between levels within a story are always permitted to be open. Enclosure requirements are not required until openings between stories are created for exit access stairways/ramps.

New 1018.3 (relocated 1009.3) – This proposed section is the text relocated from 1009.3 with some changes to the format and some changes to the specific exemptions. The code change text is formatted with underlines and strike-troughs of the relocated 1009.3 text. Each specific change is explained as follows:

New 1018.3 As an alternative to the rule with exceptions format the section was reformatted with the exceptions reconfigured as conditions which permit unprotected floor openings for exit access stairs/ramps. This is in keeping with the philosophy introduced with the vertical openings code change approved for the 2012 edition, which reconfigured the shaft enclosure exceptions to options. As part of the reformatting the statement "not required to be enclosed" has been removed from the exceptions to the body of section 1018.3. Additionally "and ramps" has been added to each condition; this was done to make it clear that the entire section addresses ramps and stairs equally. Previous section 1009.3.1 and 1009.3.1.1 through 1009.3.1.8 were the enclosure requirements applicable when a floor opening is required to be protected with a fire rated enclosure; this was deleted and not relocated to 1018. These sections were deleted entirely and not relocated to 1018 because the new sections 1018.3 and 1018.4 are proposed to reference to Section 713 for floor opening enclosure construction requirements. The original concept in E5 09/10 was to repeat the shaft enclosure requirements in the exit access stair section as exit access stair enclosure construction requirements. It was decided that this added unneeded text to the code and because it was a duplicate of requirements based on 713 that a change to one section may not be made to the companion section and therefore has the potential to set up an inconsistency with the two code sections that are intended to be the same.

1018.3 Exception/condition #1-Group I-2 and I-2 deleted from condition #1 and moved down to a new Section 1018.4, which addresses group I-2 and I-1. The restriction that requires all group I-2 and I-3 stairway floor openings to be protected with a shaft has not been changed. The last sentence stating "such interconnected stories shall not be open to other stories" was added to clarify that the first condition can only be used when there are no openings to other stories, other than the two stories connected by the exit access stair. This is to prevent other permitted floor openings from being used with this allowed opening to create a staggered opening condition where more than two stories can atmospherically communicate.

1018.3 Exception/condition #2-The use group limitation of this condition was moved from the end of the sentence to the beginning to make it easier to use so the code user can quickly identify the scope of the condition. Additionally "live/work unit" was added to the types of units that can use this condition. Unenclosed exit access stairs are permitted in live/work units per 419.4 and live/work unit is a type of group R-2 unit distinct from dwelling units and sleeping units.

1018.3 Exception/condition #3 and Deletion of exception #4-The term floor opening was replaced with vertical opening because the opening in this condition can be between multiple floors. Exception #4 was the same exception as exception #3 except that it applies to groups other than B and M with the only difference being that the opening is limited to 4 stories for groups other than B and M. To reduce the amount of text and number of conditions the "other than group B and M" provision was moved to condition #3 as the last sentence in condition #3.

1018.3 Exception/condition #4 and #5-Just reformatting as described in the 1018.3 general explanation.

1018.3 Exception/condition #6- This condition was modified with input from Ed Roether, who is an expert in stadium design. "Outdoor facilities where all portions of the means of egress are essentially open to the outside" is proposed to be changed to "open-air seating", which is the term used in section 1028.7 regarding travel distance in assembly seating. This condition is proposed to be changed to be coordinated with the requirements for open air seating as regulated by section 1028.7, which allows unlimited travel distance in non-combustible construction that has open air seating and 400 feet in combustible construction.

1018.3 previous exception #8-This exception was deleted because the 2012 IBC section 410.6 was modified to address the specific means of egress requirements for stages and technical production areas. New section 410.6.2 in the 2012 IBC specifically exempts stage and technical production areas from stair/ramp enclosure therefore this exception/condition is redundant and not needed.

1018.3 Exception/condition #7-Just reformatting as described in the 1018.3 general explanation.

1018.3 previous exception #10 deleted– This exception was moved to 1018.4

New 1018.4 – This is the relocated and reformatted requirement for group I-2 and I-3 exit access stair/ramp enclosure as part of the reformat from exceptions to conditions. Additionally, as noted above, the previous exception #10 was relocated as an exception to this requirement because it is a specific exception for group I-3.

1026.6 Exception #3 deletion- 1026.6 exception #3 was a holdover from when what are currently exit access stairs were exit stairs. Exception #3 was there to coordinate the allowance for an exterior exit stair to be unprotected when an interior exit stair would be allowed to be unprotected. E5 changed the unenclosed exit stair to an exit access stair. In keeping with that methodology this exception is being deleted and "interior" is being removed from the exit access stair and ramp definitions so that the provisions that allow an unenclosed exit access stair are equally applicable to interior or exterior stairways. Rather than use exception #3 to 1026.6 for to create an exterior exit stair without protection the exit access provisions would be used for the exterior stair.

1027.1 exception #1.1-This is an editorial change that clarifies the exit stairways/ramps must have the free path of travel. This is a companion to the new section 1.4 described below.

1027.1 exception #1.4-This limitation is proposed to prevent an exit access stair and separate exit stair, which begin on the same floor, from termination to close together on the exit discharge floor. This is proposed so that one localized fire event on the exit discharge floor will not take out the termination of both means of egress components when an exit stair is permitted to discharge into the building. The 30 feet or ¼ diagonal separation distances were based on the 30 feet or ¼ diagonal that is specified for separation of interior stairways in high-rise section 403.5.1.

1028.5 and 505.2.3- "and at least one leading directly to an exit" is proposed for deletion. ICC staff asked for the committee to look at this do to numerous interpretive questions regarding what "leading directly to an exit" means. In both of these cases exit access stairs serving 2 stories could meet 1018.3 exception #1 and since neither condition qualifies as a story allowing exit access stairways is consistent with the provisions of 1018.3. Since "directly to an exit" can be interpreted to mean the mezzanine floor or balcony must have at least one exit at the mezzanine or balcony level that text is proposed to be deleted to allow exit access stairs to be used in both cases for both sets of stairways.

403.5.1-This is in response to E5 public comments. The intent of the separation required by this section is specific to the enclosure, not the stairway, therefore this language has been corrected.

505.2.3 – See reason statement for 1028.5.

707.3.3 and 707.5.1-These changes are to coordinate with the change in section numbering that occurred with moving the exit access stairway and ramp provisions from 1009 to 1018 and the change to reference section 713 for exit access stairway and ramp rated enclosure design requirements. References related to if an enclosure is required refer to sections in 1018, which is where the requirements for when a rated enclosure is required are proposed to be relocated. References related to the construction of the rated enclosure refer to section 713, which is where the requirements for how to rate the enclosure are located.

707.7.1-References to exit access stairways and ramps are proposed to be removed from this section because section 1018 is proposed to reference section 713 for exit access stairway and ramp rated enclosure design. Existing section 713.7.1 addresses prohibited openings therefore this reference is no longer needed in section 707.7.1.

711.4- See reason statement for 707.3.3 above.

712.1.8- Criteria #2 was proposed to be deleted and was approved to be deleted in E5 09/10 but was inadvertently reinstated do to a language change proposed to the same text in FS 56 09/10. Floor openings for open exit access stairways are intended to be protected in accordance with the exit access stair provision in 1009.3 (1018 per this proposal). If Criteria #2 is retained it will cause inconsistency with the exit access stairway provisions. It was the intent of E5 09/10 to have all exit access stair related opening protection requirements provided in the exit access stair provisions in chapter 10.

712.1.12 – This section has the terminology updated from "unenclosed" to "exit access" stairway to coordinate with terminology approved in E5-09/10. Additionally the section references are updated from 1009.3 to 1018 to coordinate with the relocation of exit access stair provisions from 1009.3 to 1018, which is explained further below in the reason statement. The purpose of the section is to act as a pointer to the exit access stairway vertical opening requirements that are all provided in proposed section 1018 (previous section 1009.3) for any vertical opening that contains an exit access stairway.

713.1 – This is another coordination change related to the relocation of the access stair provisions from 1009.3 to 1018. The enclosure requirements for exit access stairways in 1018 now reference Section 713 for rated enclosure construction requirements, rather than repeating the requirements in chapter 10, therefore this sentence is no longer needed.

Cost Impact: None

E7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009-E-BALDASSARRA

E8 – 12

707.3.3, 707.5.1, 707.6, 707.7.1, 712.1.12, 712.1.18, Table 716.5, Table 803.9, [F]909.5, 1007.2, 1007.6.2, 1009.2.2, 1009.3-1009.3.1.8, 1010.2, 1028.2; (IFC 909.5, [B]1007.2, [B]1007.6.2, [B]1009.2.2, [B]1009.3-1009.3.1.8, [B]1010.2, [B]1028.2)

Proponent: Vickie Lovell, Intercode Incorporated, representing Alliance for Fire & Smoke Containment & Control, Inc. (AFSCC) (Vickie@intercodeinc.com)

Revise as follows:

SECTION 707
FIRE BARRIERS

~~**707.3.3 Enclosures for exit access stairways.** The *fire-resistance rating* of the *fire barrier* separating building areas from an *exit access stairway* or *ramp* shall comply with Section 1009.3.1.2.~~

(Renumber subsequent section)

707.5.1 Supporting construction. The supporting construction for a *fire barrier* shall be protected to afford the required *fire-resistance rating* of the *fire barrier* supported. Hollow vertical spaces within a *fire barrier* shall be fireblocked in accordance with Section 718.2 at every floor level.

Exceptions:

1. The maximum required *fire-resistance rating* for assemblies supporting *fire barriers* separating tank storage as provided for in Section 415.8.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
3. Supporting construction for 1-hour *fire barriers* required by Table 509 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.
4. Interior exit stairway and ramp enclosures required by Section 1022.2 ~~and exit access stairway and ramp enclosures required by Section 1009.3~~ shall be permitted to terminate at a top enclosure complying with Section 713.12.

707.6 Openings. Openings in a *fire barrier* shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for ~~exit access stairways and ramps,~~ interior exit stairways and ramps and exit passageways shall also comply with Sections 1022.3 and 1023.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door serving enclosures for ~~exit access stairways, *exit access* ramps,~~ interior exit stairways and interior *exit* ramps.
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E 119 or UL 263 and has a minimum *fire-resistance rating* not less than the *fire-resistance rating* of the wall.

4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a *fire barrier* separating an enclosure~~s~~ for ~~*exit access* stairways, *exit access* ramps,~~ interior exit stairways and interior exit ramps from an exit passageway in accordance with Section 1022.2.1.

707.7.1 Prohibited penetrations. Penetrations into enclosures for ~~*exit access* stairways, *exit access* ramps,~~ interior *exit* stairways, interior *exit* ramps or an exit passageway shall be allowed only when permitted by Section ~~1009.3.1.5,~~ 1022.5 or 1023.6, respectively.

SECTION 712
VERTICAL OPENINGS

712.1.12 Unenclosed stairs and ramps. Vertical ~~floor~~ stair openings created by unenclosed stairs or ramps in accordance with Sections 1009.2 ~~and 1009.3~~ shall be permitted.

~~**712.1.18 Openings otherwise permitted.** Vertical openings shall be permitted where allowed by other sections of this code.~~

SECTION 716
OPENING PROTECTIVES

Table 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL*	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire Protection	Fire resistance
Fire barriers having a required fire-resistance rating of 1-hour: Enclosures for shafts, ~~exit access stairways, exit access ramps,~~ interior exit stairways, interior exit ramps and exit passageway walls	1	1	100 sq. in.[c, d]	≤100 sq.in. = D-H-60 >100 sq.in. = D-H-T-60 or D-H-T-W-60	Not Permitted	1	Not Permitted	W-60

(Portions of table not shown remain unchanged)

Revise as follows:

SECTION 803
WALL AND CEILING FINISHES

TABLE 803.9 (IFC [B] Table 803.3)
INTERIOR WALL AND CEILING FINISH REQUIREMENJTS BY OCCUPANCY[k]

GROUP	SPRINKLERED[l]			NON-SPRINKLERED		
	Interior exit stairways, interior exit ramps and exit passageways[a, b]	**Corridors ~~and enclosure for exit access stairways and exit access ramps~~**	**Rooms and enclosed spaces[c]**	**Interior exit stairways, interior exit ramps and exit passageways[a, b]**	**Corridors ~~and enclosure for exit access stairways and exit access ramps~~**	**Rooms and enclosed spaces[c]**
I-3	A	A[j]	C	A	A	B

(No change to portions of table not shown)

a. through i. *(no change)*

j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finished floor in corridors ~~and exit access stairways and ramps~~.

k. and L. *(no change)*

Revise as follows:

SECTION 909
SMOKE CONTROL SYSTEMS

[F] 909.5 (IFC 909.5) Smoke barrier construction. *Smoke barriers* shall comply with Section 710, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls *A/A*w = 0.00100
2. Interior *exit stairways* and *ramps* and *exit passageways*:
   *A/A*w = 0.00035
3. ~~Enclosed *exit access stairways* and *ramps* and~~ All other shafts:
   *A/A*w = 0.00150
4. Floors and roofs: *A/A*F = 0.00050 where:
   A = Total leakage area, square feet (m2).
   *A*F = Unit floor or roof area of barrier, square feet (m2).
   *A*w = Unit wall area of barrier, square feet (m2).

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

Revise as follows:

SECTION 1007 (IFC [B] 1007)
ACCESSIBLE MEANS OF EGRESS

1007.2 (IFC [B] 1007.2) Continuity and components. Each required *accessible means of egress* shall be continuous to a *public way* and shall consist of one or more of the following components:

1. *Accessible* routes complying with Section 1104.
2. *Interior exit stairways* complying with Sections 1007.3 and 1022.
~~3. Interior *exit access stairways* complying with Sections 1007.3 and 1009.3.~~
~~4~~3. Exterior *exit stairways* complying with Sections 1007.3 and 1026 and serving levels other than the *level of exit discharge*.
~~5~~4. Elevators complying with Section 1007.4.

~~6~~5. Platform lifts complying with Section 1007.5.
~~7~~6. *Horizontal exits* complying with Section 1025.
~~8~~7. *Ramps* complying with Section 1010.
~~9~~8. *Areas of refuge* complying with Section 1007.6.
~~10~~9. Exterior area for assisted rescue complying with Section 1007.7.

1007.6.2 (IFC [B] 1007.6.2) Separation. Each *area of refuge* shall be separated from the remainder of the story by a *smoke barrier* complying with Section 709 or a *horizontal exit* complying with Section 1025. Each *area of refuge* shall be designed to minimize the intrusion of smoke.

Exception: *Areas of refuge* located within an *interior exit stairway or interior exit ramp* enclosure ~~for *exit access stairways* or *interior exit stairways*~~.

SECTION 1009
STAIRWAYS

1009.2.2 (IFC [B] 1009.2.2) Enclosure. All *interior exit stairways* shall be enclosed in accordance with the provisions of Section 1022.

Exceptions:

1. In other than Group I-2 and I-3 occupancies, *stairways* that serve, or atmospherically communicate between, only two stories are not required to be enclosed. Any two such atmospherically interconnected floors shall not directly communicate with other floors.
2. *Stairways* serving and contained within a single residential *dwelling unit* or *sleeping unit* in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.

1009.3 (IFC [B] 1009.3) Exit access stairways. ~~Floor openings between stories created by *exit access stairways* shall be enclosed.~~ Floor openings created by *exit access stairways* or *exit access ramps* shall comply with Section 712.

~~**Exceptions:**~~

~~1. In other than Group I-2 and I-3 occupancies, *exit access stairways* that serve, or atmospherically communicate between, only two stories are not required to be enclosed.~~
~~2. *Exit access stairways* serving and contained within a single residential *dwelling unit* or *sleeping unit* in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.~~
~~3. In buildings with only Group B or M occupancies, *exit access stairway* openings are not required to be enclosed provided that the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the *exit access stairway*, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.~~
~~4. In other than Group B and M occupancies, *exit access stairway* openings are not required to be enclosed provided that the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the *exit access stairway*, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.~~
~~5. *Exit access stairways* within an *atrium* complying with the provisions of Section 404 are not required to be enclosed.~~
~~6. *Exit access stairways* and *ramps* in open parking garages that serve only the parking garage are not required to be enclosed.~~
~~7. *Stairways* serving outdoor facilities where all portions of the *means of egress* are essentially open to the outside are not required to be enclosed.~~
~~8. *Exit access stairways* serving stages, platforms and *technical production areas* in accordance with Sections 410.6.2 and 410.6.3 are not required to be enclosed.~~

~~9. *Stairways* are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.~~

~~10. In Group I-3 occupancies, *exit access stairways* constructed in accordance with Section 408.5 are not required to be enclosed.~~

~~**1009.3.1 (IFC [B] 1009.3.1) Construction.** Where required, enclosures for *exit access stairways* shall be constructed in accordance with this section. *Exit access stairway* enclosures shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* in accordance with Section 711, or both.~~

~~**1009.3.1.1 (IFC [B] 1009.3.1.1) Materials.** *Exit access stairway* enclosures shall be of materials permitted by the building type of construction.~~

~~**1009.3.1.2 (IFC [B] 1009.3.1.2) Fire-resistance rating.** *Exit access stairway* enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the *exit access stairway* enclosures shall include any basements, but not any mezzanines. *Exit access stairway* enclosures shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours.~~

~~**1009.3.1.3 (IFC [B] 1009.3.1.3) Continuity.** *Exit access stairway* enclosures shall have continuity in accordance with Section 707.5 for *fire barriers* or Section 711.4 for *horizontal assemblies* as applicable.~~

~~**1009.3.1.4 (IFC [B] 1009.3.1.4) Openings.** Openings in an *exit access stairway* enclosure shall be protected in accordance with Section 716 as required for *fire barriers*. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.~~

~~**1009.3.1.4.1 (IFC [B] 1009.3.1.4.1) Prohibited openings.** Openings other than those necessary for the purpose of the *exit access stairway* enclosure shall not be permitted in *exit access stairway* enclosures.~~

~~**1009.3.1.5 (IFC [B] 1009.3.1.5) Penetrations.** Penetrations in an *exit access stairway* enclosure shall be protected in accordance with Section 714 as required for *fire barriers*.~~

~~**1009.3.1.5.1 (IFC [B] 1009.3.1.5.1) Prohibited penetrations.** Penetrations other than those necessary for the purpose of the *exit access stairway* enclosure shall not be permitted in *exit access stairway* enclosures.~~

~~**1009.3.1.6 (IFC [B] 1009.3.1.6) Joints.** Joints in an *exit access stairway* enclosure shall comply with Section 715.~~

~~**1009.3.1.7 (IFC [B] 1009.3.1.7) Ducts and air transfer openings.** Penetrations of an *exit access stairway* enclosure by ducts and air transfer openings shall comply with Section 717.~~

~~**1009.3.1.8 (IFC [B] 1009.3.1.8) Exterior walls.** Where *exterior walls* serve as a part of an *exit access stairway* enclosure, such walls shall comply with the requirements of Section 705 for *exterior walls* and the fire-resistance-rated enclosure requirements shall not apply.~~

(Renumber subsequent sections)

SECTION 1010
RAMPS

1010.2 (IFC [B] 1010.2) Enclosure. All *interior exit ramps* shall be enclosed in accordance with the applicable provisions of Section 1022. *Exit access ramps* shall be enclosed in accordance with the provisions of Section 1009.3 ~~for enclosure of *stairways*~~.

SECTION 1028
ASSEMBLY

1028.2 (IFC [B] 1028.2) Assembly main exit. In a building, room or space used for assembly purposes that has an *occupant load* of greater than 300 ~~and is~~ shall be provided with a main *exit*, the main *exit* shall be of sufficient width to accommodate not less than one-half of the *occupant load*, but such width shall not be less than the total required width of all *means of egress* leading to the *exit*. Where the building is classified as a Group A occupancy, the main *exit* shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or *public way*. In a building, room or space used for assembly purposes where there is no well-defined main *exit* or where multiple main *exits* are provided, *exits* shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

Reason: This code change proposal aims to greatly simplify the requirements that were added to the 2012 IBC related to the provision of exit access stairs.

Exit access stairs have always been allowed by the IBC. Throughout the 2009 IBC, reference to exit access is found in many sections, including: 404.9, 405.7, 408.5, 408.6, 411.7, 414.7, 415.8, 505.3, 715.4, 907.2, and in virtually every section of Chapter 10. Exit access stairs are referenced specifically in 1002, 1007.3, 1016.1, and 1021.1. It is not the intent of this proposal to denigrate or eliminate the appropriate use of the exit access.

The 2012 IBC greatly complicated the use of exit access stairs, adding 854 words to create a maze of rules regarding where they are allowed, where they are not allowed, and precisely how they must be constructed.

The added complexity of the exit access stair provisions that had been added to IBC 2012 did not do anything to increase the safety of building occupants and of building egress. They were part of a comprehensive revision to Chapter 10 that was submitted for the 2012 IBC as code change E5-09/10. Many of the changes in that comprehensive change proposal did greatly improve the clarity and usability of Chapter 10. However, the immensely complex additions related to exit access stairs did not add to the clarity and usability of the code. Instead, it turned an easily understood feature, whose minimal guidance in pre-2012 IBC editions was considered to be fully adequate, into a complicated maze of allowances, rules and exceptions.

This code change now aims to bring back the simplicity of designing exit access stairs by removing over 800 words that were added to the 2012 IBC related to these, allowing exit access stairs to be constructed to the same simple rules as were satisfactorily used in the 2000, 2003, 2006 and 2009 editions of the IBC.

Below is an explanation of some of the individual edits made within this code change proposal, in case it is not self-evident in all cases as to why the change was needed to maintain internal consistency of Chapter 10 and the sections that reference it:

- 707.3.3: The deletion of section 707.3.3 is necessary with the elimination of 1009.3.1.2 referenced therein.
- 707.5.1: Exception 4 to section 707.5.1 contains language referencing 1009.3 that become irrelevant with this proposal. The reference to openings in enclosures for exit access stairways and ramps becomes unnecessary as the enclosure requirement previously at 1009.3 with its associated 10 exceptions is proposed to be replaced with text referencing 712 for a list of 18 possible conditions (options) which make a vertical opening acceptable.
- 707.6, 707.7: With the conditions by which a vertical opening can be acceptable being enumerated in section 712, the deletion of references to enclosures and opening protectives for *exit access stairways* and *exit access ramps* in sections 707.6 and 707.7.1 becomes unnecessary.
- 712.1.12: This section needs to be removed, otherwise a circular reference would be created wherein 712.1.12 send the user to 1009.3 for the conditions allowing a vertical opening, and then the (revised) 1009.3 would send the user back to section 712 to find an acceptable way to construct, or protect, or enclose the exit access stair.
- 712.1.18: Removing this section would ensure that all provisions within the code that allow options for vertical openings within a building would all be located in one single section, section 712. This proposed change does not add or remove any provisions as of today, as there are no vertical opening provisions elsewhere in the code that are not enumerated in section 712. However, having this article opens the door for future changes that would run counter to the overall code strategy of having all allowable vertical opening options listed in this one place.
- Tables 716.5: With the removal of the extensive rules governing the enclosure of exit access stairs, there is no longer any need to have specific rules for opening protectives that would be needed for the exit access stair enclosure. The opening protective would now be more simply decided simply based on the type/fire rating of wall (if any) that encloses an exit access stair.
- Table 803.9: With exit access stairs no longer having specially mandated and specially-designed enclosures, there is no more need to specify special types of finishes for the surfaces of the enclosure.
- 909.5: For the same logical reasons cited above for the changes to sections within Chapter 7, section 909.5 is proposed to redact the reference to *exit access stairways* and *exit access ramps*.
- 1007.2: With the deletion of the numerous custom design details for exit access enclosures (1009.3), there is no longer a need to point to that section and mandate compliance with it.
- 1009.2: So as not to lose two valid allowances for unenclosed exit access stairs that existed within the deleted sections of 1009.3, additions are proposed to Section 1009.2 to include those exceptions, permitting floor openings for convenience stairways and for exit access within a residential *dwelling unit* or *sleeping unit* in Group R-1, R-2, and R-3 occupancies.
- 1009.3: This is the very lengthy section that added a myriad of new construction requirements in IBC 2012 for the enclosure of exit access stairs, and then a series of exceptions to those enclosure construction requirements. . Without a requirement for enclosure, there is no need for any exceptions . Exit access stairs can then be open or enclosed, as long as they meet other requirements of the code, such as having the floor opening for a desired exit access stair meet one of the vertical opening allowances as established in Section 712. Section 712 provides a long list of methods to allow various vertical openings for

numerous applications, as has been studied in great detail by the ICC Code Technology Committee, Vertical Openings Study Group, as part of the 2009 and 2012 code change cycles.

- 1010.2: It is proposed to eliminate the reference to enclosure of stairways as this requirement is superfluous, given that enclosure is required in other sections of the code. The reference to section 1009.3 for enclosure of *exit access ramps* is to remain intact.
- 1028.2: During the preparation for this code change proposal, it was discovered that the requirement for a main exit in assembly occupancies with an occupant load greater than 300 persons had been dropped during the deliberations for the 2012 IBC without sufficient justification and contrary to all previous editions of the International Building Code. Thus, section 1028.2 is proposed to be revised by the substitution of the words "shall be" for the existing text "and is" to correct this requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

E8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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E9 – 12

1001.2, 1003.6, 1005.4, 1005.5, 1005.6, 1007.6.1, 1008.1.1, 1008.1.4.1.1, 1008.1.9.4, 1008.3, 1009.4, 1009.11, 1010.6.1, 1012.9, 1017.1, 1017.5, 1018.2, Table 1018.2, 1018.3, 1019.1, 1023.2, 1025.1, 1027.1, 1027.2, 1027.4.1, 1028.2, 1028.4, 1028.6, 1028.6.1, 1028.6.2, Table 1028.6.2, 1028.6.3, 1028.9.2, 1028.9.3, 1028.9.4, 1028.9.6, 1028.10.1.1 (IFC [B] 1001.2, 1003.6, 1005.4, 1005.5, 1005.6, 1007.6.1, 1008.1.1, 1008.1.4.1.1, 1008.1.9.4, 1008.3, 1009.4, 1009.11, 1010.6.1, 1012.9, 1017.1, 1017.5, 1018.2, Table 1018.2, 1018.3, 1019.1, 1023.2, 1025.1, 1027.1, 1027.2, 1027.4.1, 1028.2, 1028.4, 1028.6, 1028.6.1, 1028.6.2, Table 1028.6.2, 1028.6.3, 1028.9.2, 1028.9.3, 1028.9.4, 1028.9.6, 1028.10.1.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

1001.2 (IFC [B] 1001.2) Minimum requirements. It shall be unlawful to alter a building or structure in a manner that will reduce the number of *exits* or the minimum width or required capacity of the *means of egress* to less than required by this code.

1003.6 (IFC [B] 1003.6) Means of egress continuity. The path of egress travel along a *means of egress* shall not be interrupted by any building element other than a *means of egress* component as specified in this chapter. Obstructions shall not be placed in the minimum width or required capacity ~~width~~ of a *means of egress* component except projections permitted by this chapter. The minimum width or required capacity of a *means of egress* system shall not be diminished along the path of egress travel.

1005.4 (IFC [B] 1005.4) Continuity. The minimum width or required capacity of the means of egress required from any story of a building shall not be reduced along the path of egress travel until arrival at the public way.

1005.5. (IFC [B] 1005.5) Distribution of ~~egress~~ minimum width and required capacity. Where more than one exit, or access to more than one exit, is required, the means of egress shall be configured such that the loss of any one exit, or access to one exit, shall not reduce the available capacity or width to less than 50 percent of the required capacity or width.

1005.6 (IFC [B] 1005.6) Egress convergence. Where the means of egress from stories above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the largest minimum width or the sum of the required capacities for the stairways or ramps serving the two adjacent stories, whichever is larger.

1007.6.1 (IFC [B] 1007.6.1) Size. Each *area of refuge* shall be sized to accommodate one *wheelchair space* of 30 inches by 48 inches (762 mm by 1219 mm) for each 200 occupants or portion thereof, based on the *occupant load* of the *area of refuge* and areas served by the *area of refuge*. Such *wheelchair spaces* shall not reduce the ~~required~~ *means of egress* minimum width or required capacity ~~width~~. Access to any of the required *wheelchair spaces* in an *area of refuge* shall not be obstructed by more than one adjoining *wheelchair space*.

1008.1.1 (IFC [B] 1008.1.1) Size of doors. The ~~minimum width~~ required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear width of 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. *Means of egress* doors in a Group I-2 occupancy used for the movement of beds shall provide a clear width not less than $41^1/_2$ inches (1054 mm). The height of door openings shall not be less than 80 inches (2032 mm).

Exceptions:

1 through 8. *(no change)*

1008.1.4.1.1 (IFC [B] 1008.1.4.1.1) Egress component. A revolving door used as a component of a *means of egress* shall comply with Section 1008.1.4.1 and the following three conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the minimum width or required ~~egress~~ capacity.
2. Each revolving door shall be credited with a capacity based on no more than a 50-person ~~capacity~~ occupant load.
3. Each revolving door shall be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

1008.1.9.4 (IFC [B] 1008.1.9.4) Bolt locks. Manually operated flush bolts or surface bolts are not permitted.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.
2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serves an occupant load of less than 50 persons in a Group B, F or S occupancy, manually operated edge- or surface- mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
4. Where a pair of doors serves a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf provided such inactive leaf is not needed to meet egress ~~width~~ capacity requirements and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
5. Where a pair of doors serves patient care rooms in Group I-2 occupancies, self-latching edge- or surface-mounted bolts are permitted on the inactive leaf provided that the inactive leaf is not needed to meet egress ~~width~~ capacity requirements and the inactive leaf contains no doorknobs, panic bars or similar operating hardware.

1008.3 (IFC [B] 1008.3) Turnstiles. Turnstiles or similar devices that restrict travel to one direction shall not be placed so as to obstruct any required *means of egress*.

Exception: Each turnstile or similar device shall be credited with a capacity based on no more than a 50-person ~~capacity~~ occupant load where all of the following provisions are met:

1. Each device shall turn free in the direction of egress travel when primary power is lost, and upon the manual release by an employee in the area.
2. Such devices are not given credit for more than 50 percent of the required egress capacity or width.
3. Each device is not more than 39 inches (991 mm) high.
4. Each device has at least $16^1/_2$ inches (419 mm) clear width at and below a height of 39 inches (991 mm) and at least 22 inches (559 mm) clear width at heights above 39 inches (991 mm).

Where located as part of an *accessible route*, turnstiles shall have at least 36 inches (914 mm) clear at and below a height of 34 inches (864 mm), at least 32 inches (813 mm) clear width between 34 inches (864 mm) and 80 inches (2032 mm) and shall consist of a mechanism other than a revolving device.

1009.4 (IFC [B] 1009.4) Width and capacity. The ~~width~~ required capacity of *stairways* shall be determined as specified in Section 1005.1, but ~~such~~ the minimum width shall not be less than 44 inches (1118 mm). See Section 1007.3 for *accessible means of egress stairways*.

Exceptions:

1. through 4. *(no change)*

1009.11 (IFC [B] 1009.11) Curved stairways. Curved stairways with winder treads shall have treads and risers in accordance with Section 1009.7 and the smallest radius shall not be less than twice the minimum width or required capacity ~~width~~ of the stairway.

Exception: The radius restriction shall not apply to curved stairways for occupancies in Group R-3 and within individual dwelling units in occupancies in Group R-2.

1010.6.1 (IFC [B] 1010.6.1) Width and capacity. The minimum width and required capacity of a *means of egress ramp* shall not be less than that required for *corridors* by Section 1018.2. The clear width of a *ramp* between *handrails*, if provided, or other permissible projections shall be 36 inches (914 mm) minimum.

1012.9 (IFC [B] 1012.9) Intermediate handrails. *Stairways* shall have intermediate *handrails* located in such a manner that all portions of the *stairway* ~~width required for egress~~ minimum width or required capacity are within 30 inches (762 mm) of a *handrail*. On monumental *stairs*, *handrails* shall be located along the most direct path of egress travel.

1017.1 (IFC [B] 1017.1) General. Aisles and aisle accessways serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles or aisle accessways shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. The minimum width or required capacity ~~width~~ of aisles shall be unobstructed.

Exception: Encroachments complying with Section 1005.7.

1017.5 (IFC [B] 1017.5) Aisles in other than assembly spaces and Groups B and M. In other than rooms or spaces used for assembly purposes and Group B and M occupancies, the minimum clear aisle ~~width~~ capacity shall be determined by Section 1005.1 for the occupant load served, but the width shall not be less than 36 inches (914 mm).

1018.2 (IFC [B] 1018.2) Width and capacity. The ~~minimum width~~ required capacity of corridors shall be determined as specified in Section 1005.1, but the minimum width shall not be less than that specified in Table 1018.2 ~~shall be as determined in Section 1005.1~~.

Table 1018.2 (IFC [B] TABLE 1018.2)
MINIMUM CORRIDOR WIDTH

Occupancy	Width (min)
Any facilities not listed below	44 inches (1118 mm)
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches (610 mm)
With an required ~~occupancy capacity~~ occupant load of less than 50	36 inches (914 mm)
Within a dwelling unit	36 inches (914 mm)

Occupancy	Width (min)
In Group E with a corridor having a ~~required capacity~~ occupant load of 100 or more	72 inches (1829 mm)
In corridors and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be not capable of self-preservation	72 inches (1829 mm)
Group I-2 in areas where required for bed movement	96 inches (2438 mm)

1018.3 (IFC [B] 1018.3) Obstruction. The minimum width or required capacity ~~width~~ of corridors shall be unobstructed.

Exception: Encroachments complying with Section 1005.7.

1019.1 (IFC [B] 1019.1) General. Balconies used for egress purposes shall conform to the same requirements as *corridors* for minimum width, required capacity, headroom, dead ends and projections.

1023.2 (IFC [B] 1023.2) Width. The ~~minimum width~~ required capacity of exit passageways shall be determined as specified in Section 1005.1 but ~~such~~ the minimum width shall not be less than 44 inches (1118 mm), except that exit passageways serving an occupant load of less than 50 shall not be less than 36 inches (914 mm) in width. The minimum width or required capacity ~~width~~ of exit passageways shall be unobstructed.

Exception: Encroachments complying with Section 1005.7.

1025.1 (IFC [B] 1025.1) Horizontal exits. *Horizontal exits* serving as an *exit* in a *means of egress* system shall comply with the requirements of this section. A *horizontal exit* shall not serve as the only *exit* from a portion of a building, and where two or more *exits* are required, not more than one-half of the total number of *exits* or total *exit* minimum width or required capacity ~~width~~ shall be *horizontal exits*.

Exceptions:

1. Horizontal exits are permitted to comprise twothirds of the required exits from any building or floor area for occupancies in Group I-2.
2. Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-
3. At least 6 square feet (0.6 m2) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

1027.1 (IFC [B] 1027.1) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 below shall not exceed 50 percent of the number and minimum width or required capacity of the required exits.

Exceptions:

1. A maximum of 50 percent of the number and minimum width or required capacity of interior exit stairways and ramps is permitted to egress through areas on the level of discharge provided all of the following are met:
   1.1 Such enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.
   1.2 The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.

1.3 The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.

2. A maximum of 50 percent of the number and <u>minimum width or required</u> capacity of the interior exit stairways and ramps is permitted to egress through a vestibule provided all of the following are met:
   2.1 The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.
   2.2 The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
   2.3 The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
   2.4 The area is used only for means of egress and exits directly to the outside.
3. Horizontal exits complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

1027.2 (IFC [B] 1027.2) Exit discharge <u>width or</u> capacity. The <u>minimum width or required</u> capacity of the exit discharge shall be not less than the ~~required discharge~~ <u>minimum width or required</u> capacity of the exits being served.

1027.4.1 (IFC [B] 1027.4.1) Width <u>or capacity</u>. The ~~minimum width~~ <u>required capacity</u> of egress courts shall be determined as specified in Section 1005.1, but ~~such~~ <u>the minimum</u> width shall not be less than 44 inches (1118 mm), except as specified herein. Egress courts serving Group R-3 and U occupancies shall not be less than 36 inches (914 mm) in width. The required <u>capacity and</u> width of egress courts shall be unobstructed to a height of 7 feet (2134 mm).

Exception: Encroachments complying with Section 1005.7.

Where an egress court exceeds the minimum required width and the width of such egress court is then reduced along the path of exit travel, the reduction in width shall be gradual. The transition in width shall be affected by a guard not less than 36 inches (914 mm) in height and shall not create an angle of more than 30 degrees (0.52 rad) with respect to the axis of the egress court along the path of egress travel. In no case shall the width of the egress court be less than the required ~~minimum~~ <u>capacity</u>.

1028.2 (IFC [B] 1028.2) Assembly main exit. A building, room or space used for assembly purposes that has an occupant load of greater than 300 and provided with a main exit, the main exit shall be of sufficient ~~width~~ <u>capacity</u> to accommodate not less than one-half of the occupant load, but such ~~width~~ <u>capacity</u> shall not be less than the total required ~~width~~ <u>capacity</u> of all means of egress leading to the exit. Where the building is classified as a Group A occupancy, the main exit shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or public way. In a building, room or space used for assembly purposes where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total ~~width~~ <u>capacity</u> of egress is not less than 100 percent of the required ~~width~~ <u>capacity</u>.

1028.4 (IFC [B] 1028.4) Foyers and lobbies. In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available such persons shall be allowed to wait in a lobby or similar space, provided such lobby or similar space shall not encroach upon the <u>minimum width or</u> required ~~clear~~ <u>capacity</u> ~~width~~ of the means of egress. Such foyer, if not directly connected to a public street by all the main entrances or exits, shall have a straight and unobstructed corridor or path of travel to every such main entrance or exit.

1028.6 (IFC [B] 1028.6) ~~Width~~ Capacity of means of egress for assembly. The ~~clear width~~ capacity of aisles and other means of egress shall comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The ~~clear width~~ capacity shall be measured to walls, edges of seating and tread edges except for permitted projections.

1028.6.1 (IFC [B] 1028.6.1) Without smoke protection. The ~~clear width of the~~ means of egress shall provide ~~sufficient~~ capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of width for each occupant served shall be provided on stairs having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional stair ~~width~~ capacity for each occupant shall be provided for each 0.10 inch (2.5mm)of riser height above 7 inches (178 mm).
3. Where egress requires stair descent, at least 0.075 inch (1.9 mm) of additional ~~width~~ capacity for each occupant shall be provided on those portions of stair ~~width~~ capacity having no handrail within a horizontal distance of 30 inches (762 mm).
4. Ramped means of egress, where slopes are steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.22 inch (5.6 mm) of ~~clear width~~ capacity for each occupant served. Level or ramped means of egress, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of ~~clear width~~ capacity for each occupant served.

1028.6.2 (IFC [B] 1028.6.2) Smoke-protected seating. The ~~clear width~~ capacity of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for smoke-protected assembly seating.

Exception: For an outdoor smoke-protected assembly seating with an occupant load not greater than 18,000, the ~~clear width~~ capacity shall be determined using the factors in Section 1028.6.3.

TABLE 1028.6.2 (IFC [B] TABLE 1028.6.2)
~~WIDTH~~ CAPACITY OF AISLES FOR SMOKE-PROTECTED ASSEMBLY

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY SEATING	INCHES OF ~~CLEAR WIDTH~~ CAPACITY PER SEAT SERVED			
	Stairs and aisle steps with handrails within 30 inches	Stairs and aisle steps without handrails within 30 inches	Passageways, doorways and ramps not steeper than 1 in 10 in slope	Ramps steeper than 1 in 10 in slope
Equal to or less than 5,000	0.200	0.250	0.150	0.165
10,000	0.130	0.163	0.100	0.110
15,000	0.096	0.120	0.070	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.060	0.075	0.044	0.048

For SI: 1 inch = 25.4 mm.

1028.6.3 (IFC [B] 1028.6.3) ~~Width~~ Capacity of means of egress for outdoor smoke-protected assembly seating. The ~~clear width~~ capacity in inches (mm) of aisles and other means of egress shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by aisles and stairs and multiplied by 0.06 (1.52 mm) where egress is by ramps, corridors, tunnels or vomitories.

Exception: The ~~clear width~~ capacity in inches (mm) of aisles and other means of egress shall be permitted to comply with Section 1028.6.2 for the number of seats in the outdoor smoke-protected assembly seating where Section 1028.6.2 permits less ~~width~~ capacity.

1028.9.2 (IFC [B] 1028.9.2) Aisle ~~width~~ capacity. The aisle ~~width~~ shall provide sufficient ~~egress~~ capacity for the number of persons accommodated by the catchment area served by the aisle. The catchment area served by an aisle is that portion of the total space that is served by that section of the aisle. In establishing catchment areas, the assumption shall be made that there is a balanced use of all means of egress, with the number of persons in proportion to egress capacity.

1028.9.3 (IFC [B] 1028.9.3) Converging aisles. Where aisles converge to form a single path of egress travel, the required ~~egress~~ capacity of that path shall not be less than the combined required capacity of the converging aisles.

1028.9.4 (IFC [B] 1028.9.4) Uniform width and capacity. Those portions of aisles, where egress is possible in either of two directions, shall be uniform in minimum width or required capacity ~~width~~.

1028.9.6 (IFC [B] 1028.9.6) Assembly aisle obstructions. There shall be no obstructions in the minimum width or required capacity ~~width~~ of aisles except for handrails as provided in Section 1028.13.

1028.10.1.1 (IFC [B] 1028.10.1.1) Aisle accessway capacity and width for seating at tables. Aisle accessways serving arrangements of seating at tables or counters shall ~~have sufficient clear width to~~ conform to the capacity requirements of Section 1005.1 but shall not have less than a minimum of 12 inches (305 mm) of width plus 1/2 inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.

Exception: Portions of an aisle accessway having a length not exceeding 6 feet (1829 mm) and used by a total of not more than four persons.

Reason: Section 1005 was improved in the 2012 Edition of the IBC. Formerly, the terms “width” and “capacity” were used inconsistently and often interchangeably. The section was re-titled to “Means of Egress Sizing.” Section 1005.2 establishes the context of the term “width,” explaining that it is the minimum width, in inches, of any means of egress component based on other Chapter 10 prescriptive minimum requirements. Section 1005.3 states the term “capacity” is the dimension, in inches, necessary to accommodate the design occupant load at a given point along the path of egress travel.

This proposal reviews the use of the terms “width” and “capacity” throughout Chapter 10 and places them in context with the stated specific technical requirement and the intent of Section 1005. Where minimum prescriptive dimensions of various means of egress components are referenced, the term “width” or “minimum width” is used. Where the calculated dimension based on the occupant load served is referenced, the term “capacity” or “required capacity” is used.

This proposal editorially corrects the misuse of the terms “width” and “capacity” and places them in context with the intent of 2012 IBC Section 1005. Approval will reduce confusion and increase consistency in the determination of IBC means of egress sizing provisions.

Cost Impact: None

E9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1001.2-E-Keith.doc

E10-12/13
1003.3, 1003.3.3 (IFC [B] 1003.3, 1003.3.3)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1003.3 (IFC [B] 1003.3) Protruding objects. Protruding objects on circulations paths shall comply with the requirements of Sections 1003.3.1 through 1003.3.4.

1003.3.3 (IFC [B] 1003.3.3) Horizontal projections. ~~Structural elements, fixtures or furnishings shall not project horizontally from either side more than 4 inches (102 mm) over any walking surface between the heights of 27 inches (686 mm) and 80 inches (2032 mm) above the walking surface~~. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the floor shall not project horizontally more than 4 inches (100 mm) into the circulation path.

Exception: *Handrails* are permitted to protrude 41/2 inches (114 mm) from the wall.

Reason: All existing buildings using the performance compliance alternative should meet the accessibility provisions for existing building, not just those undergoing a change of occupancy.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3.3-E-Baldassarra.docx

E11 – 12
1003.4, Chapter 35 (IFC [B] 1003.4, Chapter 80)

Proponent: J. George Sotter, Sotter Engineering Corp., representing self (sottergeo@aol.com)

Revise as follows:

~~**1003.4 (IFC [B] 1003.4) Floor surface.** Walking surfaces of the means of egress shall have a slip-resistant surface and be securely attached.~~

<u>**1003.4 (IFC [B] 1003.4) Slip resistance.** For a level floor that can get wet due to tracked-in precipitation, dripping raincoats, frequent spills, automatic sprinklers, condensation, buyer shall give consideration to a non-mandatory minimum British Pendulum Number (BPN) as specified by the HB197, Tables 2 and 3.</u>

<u>If anti-slip strips are used to provide the necessary slip resistance, they shall be placed perpendicular to the dominant direction of travel and no more than 1.5 inches (38 mm) apart and shall be maintained in good condition.</u>

<u>The minimum slip resistance shall be maintained throughout the lifetime of the flooring, whether the flooring is wet (if appropriate) or dry, clean or dirty.</u>

<u>If the British Pendulum Number of the flooring in use is up to 11 units lower than the minimum in the guidelines (e.g. BPN of as low as 24 when the minimum specified is 35) special actions should be considered: e.g. provide at least 15 feet of absorbent matting to dry shoes before pedestrians reach the bare floor; provide umbrella bags at entrances from outdoors; deploy warning notices; dry frequently with an oil-free dry mop; and/or mandate use of adequate anti-slip footwear the treads of which are in good condition. If BPN is lower than the action level the floor should be considered hazardous.</u>

Add new standard to IBC Chapter 35, and IFC Chapter 80.

Standards Australia
GPO Box 5420
Sydney NSW 2001, Australia.

<u>HB197:1999</u>	<u>"An Introductory Guide to the Slip Resistance of Pedestrian Surface Materials,"</u> <u>1003.4(IFC [B] 1003.4)</u>

Reason: Purpose is to prevent slip-fall injuries and the resulting damages and litigation, as well as to prevent invesment in flooring that is hazardous in its intended use.

The present Code relies on *static* coefficient of friction, which has been scientifically proven to be an unreliable indicator of slip resistance for a walking pedestrian. This leads to slippery floors being purchased and installed, and eventually often results in injuries and lawsuits costing up to multiple millions of dollars. Previous recommended slip resistance safety standards quoted by the U.S. Department of Justice Access Board and based on static coefficient of friction were inadequate for assessing safety and were withdrawn by the Access Board (Starnes, 2011). There at present is no rational safety criterion for builders to use.

The British Pendulum *dynamic* method used for testing by the referenced standard has been endorsed by Ceramic Tile Institute of America since 2001. Through European Standard EN-13036–4, the pendulum method (invented by the U.S. National Bureau of Standards) is now a national standard in 49 nations, on four continents, many of which are part of or affiliated with the European Union.

The pendulum was most recently again validated vs. human traction tests (23 males, 57 females) in a University of California Biomechanics Research Laboratory study published by Powers, et al. in *J. Forensic Sci*, March 2010, Vol. 55, No. 2 (interscience.wiley.com).

A BPN minimum of 35 or higher for level floors has been endorsed by the UK government's Health and Safety Executive for many years, has been in continuous use in the UK since 1971, and has been endorsed by Ceramic Tile Institute of America since 2001. It was first published by the Greater London Council in 1971 and reaffirmed in 1985 after a 25-year study involving 3500 realworld field tests correlated with accident history.

More detailed minimum BPN safety standards based on the pendulum method have been used in Australia and New Zealand under AUS/NZ Standard HB 197–1999 for 11 years, following German standards that have been in effect even longer. These are not "one size fits all," but have appropriate proven consensus standards for different situations: e.g. external stair nosings, bathrooms in hospital and aged care facilities, food courts, swimming pool decks, entry foyers, etc

The referenced Australian standard is needed because there is no native standard in the USA that has the proven validity, plus over a decade of experience in commercial use, of the standards developed in Australia, New Zealand, Germany, and the United Kingdom.

The current ICC code in effect specifies a non-valid test method (static coefficient of friction) for assessing safety, but gives no guidance as to what minimum test result is needed for safety in any particular situation. It therefore calls upon manufacturer and purchaser of flooring to apply expertise for which there is no common trustworthy reference other than the proposed standard.

Bibliography: References below are attached to this Email as separate files in pdf form.

1. American Society for Testing and Materials, Standard E303-93 (reapproved 2008), ASTM International, Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester, http://www.astm.org/Standards/E303.htm
2. British Standards, "Pendulum Testers," BS 7976, ISBN 0 580 40146 4, 20 August 2002, http://www.techstreet.com/cgibin/results, excerpt from part 3 attached
3. Ceramic Tile Institute of America Inc., Floor Safety Report #1: "Endorsement of Portable Test Methods and Slip Prevention Standards For Existing Flooring," http://www.ctioa.org/reports/cof18.html
4. Powers, C, Blanchette, M., et al., "Validation of Walkway Tribometers: Establishing a Reference Standard," *J. Forensic Sci.* March 2010, Vol. 55, No. 2, available online at: www.interscience.wiley.com
5. Sotter, G., Stone, S., et al., "Analysis of Floor-Shoe Static Friction Needed to Control a Wheelchair, Gurney, or Pallet Jack on a Ramp Manually," Proceedings of the XIX Annual International Occupational Ergonomics and Safety Conference, ISOES, Las Vegas, NV, USA, 27-29 June 2005, http://isoes.info, or available at no charge from J.G. Sotter at sottergeo@aol.com
6. Starnes, N., Chairperson, U.S. Access Board, letters to J. George Sotter of Sotter Engineering Corporation (Mission Viejo, CA) dated March 22, 2011 and May 17, 2011, available at no charge from J.G. Sotter at sottergeo@aol.com
7. Standards Australia, HB 197:1999: "An introductory guide to the slip resistance of pedestrian surface materials," http://infostore.saiglobal.com/store/Details.aspx?productid=568795
8. Australian/New Zealand Standard AS/NZS 4586:2004, Standards Australia and Standards New Zealand, 2004.
9. UK Slip Resistance Group 2011, "The Assessment of Floor Slip Resistance: The UK Slip Resistance Group Guidelines, Issue 4.0, September 2011", http://www.ukslipresistance.org.uk/index.php?id=guidelines_order
10. Greater London Council, GLC Bulletin No. 43, March 1971, London, United Kingdom, available in pdf form at SafetyDirectAmerica.com, "Testing and Instruments — Pendulum"
11. Greater London Council, GLC Bulletin 145, February 1985, ibid.

Cost Impact: The code change proposal will not increase the cost of construction. This is a cost-saving change for builders/building owners. Flooring manufacturers will supply pendulum test data for flooring that meets the above criteria. They presently provide static coefficient of friction data (inadequate for assessing safety, as discussed above) on many flooring products at no cost. *Static coefficient data are unnecessary and misleading,* and pendulum tests can be conducted instead by flooring manufacturers or preferably independent laboratories at the same cost. The pendulum tester is not patented or proprietary, and there are several manufacturers that supply it. In the 49 nations that specify the pendulum tester as a national standard for pedestrian slip resistance, no static coefficient of friction test is required.

Costs of damages and personal injury litigation to building owners will be substantially reduced. Liability insurance premiums will potentially be reduced for some owners. In addition, this code change will prevent ill-advised investment in flooring that is hazardous in its intended use.

Analysis: A review of the standard proposed for inclusion in the code, HB197, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

E11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.4-E-Sotter.doc

E12 – 12
1003.4.1 (New) [IFC [B] 1003.4.1 (New)]

Proponent: Eric Astrachan, Executive Director, Tile Council of North America, Inc. (eastrachan@tileusa.com)

Add new text as follows:

1003.4.1 (IFC [B] 1003.4.1) Ceramic and Porcelain Tile. Tiles specified for interior floor surfaces of the means of egress shall comply with ANSI A137.1, Section 6.2.2.1.10.

Reason: Currently, Section 1003.4 requires that walking surfaces of the means of egress be "slip resistant" with no method of measurement, quantitative threshold, or general principles to help the specifier, end-user, and code official.

The purpose of this revision is to provide these criteria for ceramic tiles used for interior floor surfaces of the means of egress. Section 6.2.2.1.10 of the ANSI A137.1-2012 standard for ceramic tile sets forth a quantitative minimum threshold, means of measurement, and general principles regarding slip resistance based on the consensus of a broad range of stakeholders.

Cost Impact: None

E12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.4.1(new)-E-Astrachan.doc

E13 – 12
1003.7 (New) (IFC [B] 1003.7 (New)]

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Add new text as follows:

1003.7 (IFC [B] 1003.7) Maintenance of exits and exit access. The minimum number of required independent exits and exit access paths, once provided from any portion of the exit access or story, shall not be reduced or merged together.

(Renumber subsequent sections)

Reason: General Section 1003.6 adequately addresses the need to maintain egress component capacity throughout the means of egress system. There is no such section that serves to tie together and maintain the minimum number of independent exit paths moving from exit access, to exits, to exit discharge.

Cost Impact: This code change will not increase the cost of construction.

E13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.7 (New)-E-Richardson.doc

E14 – 12
1003.6, 1004.1.1, 1004.1.1.1, 1004.1.1.2, 1004.1.2, 1005.3.1, 1005.4, 1015.1, 1020.1, 1021.2 (IFC [B] 1003.6, 1004.1.1, 1004.1.1.1, 1004.1.1.2, 1004.1.2, 1005.3.1, 1005.4, 1015.1, 1020.1, 1021.2)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

1003.6 (IFC [B] 1003.6) Means of egress continuity. The path of egress travel along a *means of egress* shall not be interrupted by any building element other than a *means of egress* component as specified in this chapter. Obstructions shall not be placed in the required width of a *means of egress* except projections permitted by this chapter. ~~The required capacity of a *means of egress* system shall not be diminished along the path of egress travel.~~

~~1004.1.2~~ 1004.2 (IFC [B] ~~1004.1.2~~ 1004.2) Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.1.2. For rooms, areas or spaces without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant load factor assigned to the function of the space as set forth in Table 1004.1.2. Where an intended function is not listed in Table 1004.1.2, the building official shall establish a function based on a listed function that most nearly resembles the intended function.

(Renumber subsequent sections)

1005.1 (IFC [B] 1005.1) General. All portions of the means of egress system shall be sized in accordance with this section.

Exception: Means of egress complying with Section 1028.

~~1004.1.1~~ 1005.1.1 (IFC [B] ~~1004.1.1~~ 1005.1.1) Cumulative occupant loads. Where the path of egress travel includes intervening rooms, areas or spaces, ~~cumulative occupant loads~~ the required capacity shall be determined in accordance with this section.

~~1004.1.1.1~~ 1005.1.1.1 (IFC [B] ~~1004.1.1.1~~ 1005.1.1.1) Intervening spaces. Where occupants egress from one room, area or space through another, the ~~design occupant load~~ required capacity shall be based on ~~the cumulative~~ that portion of the occupant loads having required egress through adjacent ~~of all~~ rooms, areas or spaces added to the occupant load of the space under consideration to that point along the path of egress travel.

~~1004.1.1.2~~ 1005.1.1.2 (IFC [B] ~~1004.1.1.2~~ 1005.1.1.2) Adjacent levels. ~~The occupant load of a mezzanine or story with egress through a room, area or space on an adjacent level shall be added to the occupant load of that room, area or space.~~ Where interior and exterior exit stairways or ramps serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of such stairways or ramps serving that story. Where exit access stairways or ramps provide required access to an exit at an adjacent story, the required capacity of the adjacent story shall be based on that portion of the occupant load of the mezzanine or story having required egress through such adjacent story added to the occupant load of that story.

1005.3.1 (IFC [B] 1005.3.1) Stairways. The capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inches (7.62 mm) per occupant. ~~Where stairways serve more than one story, only the occupant~~

~~load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story.~~

Exception: For other than Group H and I-2 occupancies, the capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.2 inches (5.1 mm) per occupant in buildings equipped throughout with and automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

1005.4 (IFC [B] 1005.4) Continuity. The capacity of the means of egress required from any room, area, space, mezzanine or story of a building shall not be reduced along the path of egress travel until arrival at the public way.

1015.1 (IFC [B] 1015.1) Exits or exit access doorways from spaces. Two exits or exit access doorways from any room, area or space shall be provided where one of the following conditions exists:

1. The *occupant load* of the space exceeds one of the values in Table 1015.1. When occupants egress through the space, that portion of the occupant load having required egress through such space to that point along the path of egress travel shall be added to the occupant load of the space under consideration.

   Exceptions:

   1. In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. Care suites in Group I-2 occupancies complying with Section 407.4.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.

Once established, the required number of exits or exit access doorways shall be maintained until arrival at the exit discharge or public way.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. ~~Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.~~

1020.1 (IFC [B] 1020.1) General. *Exits* shall comply with Sections 1020 through 1026 and the applicable requirements of Sections 1003 through 1013. An *exit* shall not be used for any purpose that interferes with its function as a *means of egress*. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the *exit discharge*. Within a building, once established, the required number of exits shall be maintained until arrival at the exit discharge or public way.

1021.2 (IFC [B] 1021.2) Exits from stories. Two exits, or exit access stairways or ramps providing access to exits, from any story or occupied roof shall be provided where one of the following conditions exists:

1. The occupant load or number of dwelling units exceeds one of the values in Table 1021.2(1) or 1021.2(2). When exit access stairways or ramps provide required access to an exit at an adjacent story, the occupant load of the adjacent story shall be based on that portion of the occupant load of the mezzanine or story having required egress through such adjacent story added to the occupant load story under consideration.
2. The exit access travel distance exceeds that specified in Table 1021.2(1) or 1021.2(2) as determined in accordance with the provisions of Section 1016.1.

3. Helistop landing areas located on buildings or structures shall be provided with two exits, or exit access stairways or ramps providing access to exits.

Exceptions:

1. Rooms, areas and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit.
2. Group R-3 occupancy buildings shall be permitted to have a one exit.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one exit,
4. Air traffic control towers shall be provided with the minimum number of exits specified in Section 412.3.
5. Individual dwelling units in compliance with Section 1021.2.3.
6. Group R-3 and R-4 congregate residences shall be permitted to have one exit.
7. ~~Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:~~
   - ~~7.1 The number of exits from the entire story complies with Table 1021.1(1) or 1021.2(2);~~
   - ~~7.2 The access to exits from each individual space in the story complies with Section 1015.1; and~~
   - ~~7.3 All spaces within each portion of a story shall have access to the minimum number of approved independent exits as specified in Table 1021.1(1) or 1021.2(2) based on the occupant load of that portion of the story.~~

Reason: The 2012 Edition of the IBC is significant in that many fundamental Chapter 10 provisions have been clarified by modifying terminology or technical correlation. E10-09/10 and E22-09/10 were two such contributing proposals. Through those proposals, Sections 1004 and 1005 were altered to place means of egress occupant load determination and sizing provisions in functional context. When provisions are placed in proper technical context so as to gain consistency in interpretation and application, additional clarification is often required to complete the thought process and maximize understanding of the intent of the specific requirement.

Proposed revisions are explained in numerical order. Presently, means of egress capacity continuity requirements are located in two sections, Section 1003.6 and 1005.4. Section 1003.6 does not contain a key requirement that the required capacity shall not be reduced until arrival at the public way. The two sections have been consolidated, clarified and located in technical context in Section 1005.4. Code users are not well served by having fundamental code requirements fragmented at two separate locations. Section 1005 is the logical location for this important means of egress sizing provision.

This proposal places cumulative occupant load application requirements in the technical context of various means of egress design requirements such as required capacity and minimum numbers of exits or access to exits. Relocation of the cumulative occupant load provisions from Section 1004.1.1 inadvertently removes the spatial charging language of “rooms, areas or spaces” from Section 1004. Therefore, these terms are replaced in technical context in the next section, Section 1004.1.2, and technical continuity is maintained.

Section 1005.1 now contains provisions for how cumulative occupants loads are to be specifically applied in the determination of means of egress capacity requirements. Additionally, provisions have been clarified be consistent with current IBC means of egress capacity philosophy. For instance, 2012 Section 1004.1.1.2 (proposed Section 1005.1.1.2) implies that 100 percent of the occupant load of an adjacent level is to be added to the occupant load of a space under consideration at another building level. This proposal clarifies that only that portion of the occupant load having <u>required</u> egress through the adjacent level needs to be considered. Additionally, the last sentence of Section 1005.3.1 has been clarified and relocated in context in new Section 1005.1.1.2. It clarifies that cumulative occupant loads are not considered only when exit stairways (interior and exterior exit stairways) are employed in the design of the means of egress system. The current language states that <u>any</u> stairway, to include required exit access stairways, need not consider cumulative occupant loads. Historically, occupant loads from adjacent stories have not been considered when determining the required capacity for only exit components.

As previously discussed, means of egress capacity continuity provisions have been consolidated and located in technical context in Section 1005.4.

Cumulative occupant load provisions specifically applicable to the determination of the number of exits or exit access doorways from an individual room, area or space have been placed in context in Section 1015.1. Presently, the requirement that, “cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.” is located as an afterthought cross-reference as the last sentence of Section 1015.1. The actual requirement has been articulated and placed in technical context in the section. Additionally, currently there is no requirement to maintain the required number of exits or exit access doorways, once established, until arrival at the exit discharge or public way. This logical requirement will now be legally charged.

Section 1020.1 has also been revised to include a legal requirement that the required number of exits be maintained within a building.

Section 1021.2 has been modified to include guidance as to what portion of the occupant loads of an adjacent story are to be applied in the determination of the number of exits required from a story above or below. Also, Exception 7 to Section 1021.2 has been deleted as there is currently no requirement for specific spaces to have access to all exits on a story.

In summary, this proposal clarifies how cumulative occupant loads are to be applied in the determination of specific means of egress design requirements. The general provisions currently located in Section 1004.1.1 are replaced by more specifically applicable requirements located in context at Sections 1005.1.1, 1015.1 and 1021.2. The provisions have also been clarified to indicate what portions of occupant loads from adjacent spaces are to be considered under the various design conditions. It should be noted that this proposal is consistent with current IBC means of egress design philosophy. Approval of this proposal will provide necessary guidance to designers and enforcement officials in these fundamental means of egress areas and will lead to more consistent interpretation and application of these important provisions. Through improved formatting and language this proposal further clarifies 2012 IBC means of egress provisions and increases functionality and technical continuity in this important area of life safety.

Cost Impact: None

E14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1004.1.1.1-E-Keith.doc

E15 – 12
1004.1.1.1, 1004.1.1.2, 1014.2 (IFC [B] 1004.1.1.1, 1004.1.1.2, 1014.2)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1004.1.1.1 (IFC [B] 1004.1.1.1) Intervening spaces. Where occupants egress from one or more room, area or space through another, the design *occupant load* shall be based on the combination of occupant load from all rooms, and spaces served. The capacity of each exit access path component shall be based on the cumulative *occupant loads* comprised of a portion of the occupant load of all rooms, areas or spaces accumulated to that point along each ~~the~~ path of egress travel.

1004.1.1.2 (IFC [B] 1004.1.1.2) Adjacent levels. The *occupant load* of a *mezzanine* or story with egress through a room, area or space on an adjacent level shall be ~~added to the *occupant load* of that room, area or space.~~ determined as required for intervening spaces in Section 1004.1.1.1.

1014.2 (IFC [B] 1014.2) Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

The minimum number of exits or exit access doors required from all interconnected portions of the exit access shall be provided based on the combined occupant load of all intervening rooms and spaces served as specified in Section 1015.1 and each room, area, or portion of the exit access shall have exits or access to exits as required from spaces. The capacity of each exit access path component at any point shall be based on the cumulative occupant load served as specified in Section1004.1.1.1 and the requirements for egress component sizing in Section 1005.1.

Reason: Egress paths from rooms, areas and spaces for each portion of the exit access in the aggregate must comply with all the requirements for number of exits or exit access doors, arrangement, as well as the sizing and specific requirements of components along each exit access path.

Unfortunately the current language in 1004.1.1.1 implies the design occupant load for components of the exit path is total cumulative occupant load of all rooms areas or spaces along a path without making a distinction regarding the portion of occupant load that must be addressed along each path to ensure the proper sizing of egress components which is different from the overall design occupant load used to determine the total number of exits or exit access doors from the overall system. Also the current language treats intervening rooms differently than exit access to adjacent levels.

Egress through intervening spaces is very similar to egress along exit access stairs and mezzanine stairs making its way to an exit on an adjacent level. In both the intervening room and the exit access through an adjacent level, the exit access path occurring on an exit access stairway may be one of many exit access paths or the only exit access path depending on the number or required egress paths from a specific space. The basic principle does not change and should be treated consistently exit access paths through intervening spaces and for exit access paths to adjacent levels subject to the existing limitations of numbers of exit access stairways given credit from a given story which does not change as part of this proposed code change.

Cost Impact: This change will not increase the cost of construction as it states what is already intended by the code.

E15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1004.1.1.1-E-RICHARDSON

E16 – 12
1004.1.1 (IFC [B] 1004.1.1)

Proponent: Ray Grill, P.E., Arup, representing self (Ray.Grill@arupgp.com)

Revise as follows:

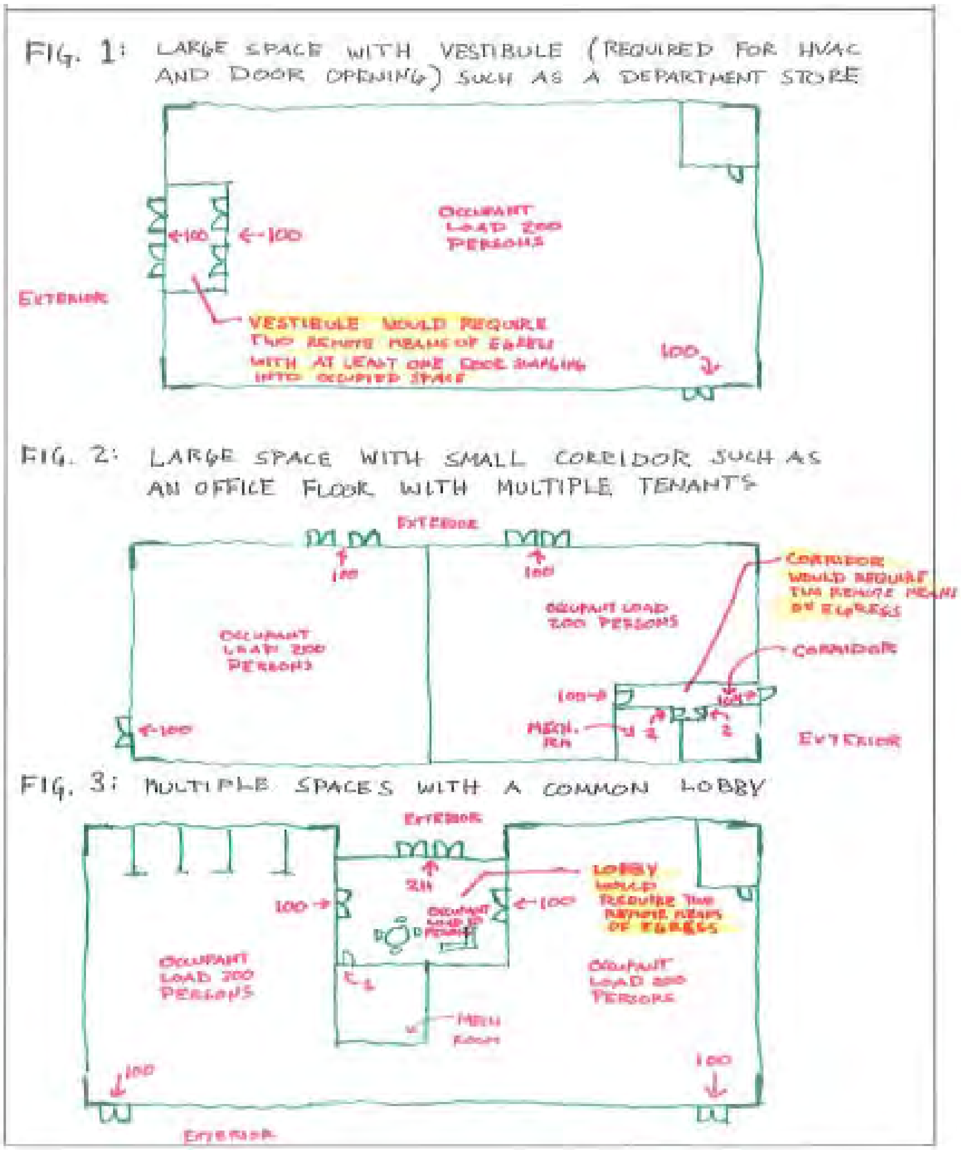
1004.1.1 (IFC [B] 1004.1.1) Cumulative occupant loads. Where the path of egress travel includes intervening rooms, areas or spaces, cumulative *occupant loads* shall be determined in accordance with this section.

> **Exception:** Vestibules and corridors providing access to exits or exit discharges shall not be considered intervening rooms, areas or spaces.

Reason: The current language of the code is being interpreted to require vestibules or corridors that serve as part of a path of egress to be provided with the number of exits based on the occupant load passing thru the vestibule or corridor to the exit.

For instance if 100 occupants are passing thru a vestibule to the outside, the code is being interpreted to require that the vestibule have another exit and that the doors to both exits swing in the direction of egress travel. This is impractical and does not increase the level of safety.

Here are some illustrations of conditions that have received this interpretation.



Cost Impact: None

E16-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1004.1.1-E-Grill.doc

E17-12
1004.1.1.2, 1005.3.1, 1005.3.2 (IFC [B] 1004.1.1.2, 1005.3.1, 1005.3.2)

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

1004.1.1.2 (IFC [B] 1004.1.1.2) Adjacent levels. That portion of the occupant load of a mezzanine or story with required egress through a room, area or space on an adjacent story ~~level~~ shall be added to the occupant load of that room, area or space.

1005.3.1 (IFC [B] 1005.3.1) Stairways. The capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inches (7.62 mm) per occupant. Where interior or exterior exit stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story. Where exit access stairways provide required access to an exit at an adjacent story, the occupant load determined in accordance with Section 1004.1.1.2 shall be used in calculating the required capacity of the means of egress serving that story.

> **Exception:** For other than Group H and I-2 occupancies, the capacity, in inches (mm), of *means of egress stairways* shall be calculated by multiplying the *occupant load* served by such *stairway* by a *means of egress* capacity factor of 0.2 inch (5.1 mm) per occupant in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an *emergency voice/alarm communication system* in accordance with Section 907.5.2.2.

1005.3.2 (IFC [B] 1005.3.2) Other egress components. The capacity, in inches (mm), of *means of egress* components other than *stairways* shall be calculated by multiplying the *occupant load* served by such component by a *means of egress* capacity factor of 0.2 inch (5.1 mm) per occupant. Where exit access ramps provide required access to an exit at an adjacent story, the occupant load determined in accordance with Section 1004.1.1.2 shall be used in calculating the required capacity of the means of egress serving that story.

> **Exception:** For other than Group H and I-2 occupancies, the capacity, in inches (mm), of *means of egress* components other than *stairways* shall be calculated by multiplying the *occupant load* served by such component by a *means of egress* capacity factor of 0.15 inch (3.8 mm) per occupant in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an *emergency voice/alarm communication system* in accordance with Section 907.5.2.2.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The 2012 Edition of the IBC has formalized the concept of accessing exits from adjacent stories. Accordingly, several means of egress design details need to be clarified so as to be consistent with the intent of Section 1021. Currently, Section 1004.1.1.2 literally requires that (100% of) the occupant load of a mezzanine or story with egress through a room, area or space on an adjacent level shall be added to the occupant load of that room, area or space. That would be appropriate if there were no other exits serving the mezzanine or story. However, if the mezzanine or story also has other independent exits that do not egress through the adjacent story, it is reasonable to assume these other independent exits can and will be used by the occupants of that mezzanine or story. This proposal clarifies that only that portion of the occupant load of the level of origin actually using exit access stairways need be used in determining means of egress requirements for the adjacent story. To be consistent with this philosophy, Section 1005.3.2 has also been modified to state an identical provision for exit access ramps which provide required access to an exit at an adjacent story.

Additionally, Section 1005.3.1 has been modified to clarify that only the occupant load of a story directly accessing an interior exit stairway need be considered in determining the required capacity of such interior exit stairway that serves additional stories. The cascade effect is accounted for in the means of egress capacity factor for stairways in Section 1005.3.1. A cross-reference to the method for determining the required capacity for areas served by exit access stairways from an adjacent level has also been provided.

Section 1004.6 (Mezzanine levels) of the 2009 IBC reads very similarly to Section 1004.1.1.2 (Adjacent levels) of the 2012 IBC. The 2009 IBC Commentary states, "The egress requirements for mezzanines are handled similar to those addressed in Section 1004.1 with accessory areas versus the requirements for exiting from multiple levels in Section 1004.4. That is, that portion of the mezzanine occupant load that discharges to the floor below is to be added to the occupant load of the space on the floor below. The sizing and number of the egress components must reflect this combined occupant load. This does not apply to the means of egress from a mezzanine that does not require travel through another level (i.e., an exit stairway serving the mezzanine)."

Clarification is achieved by adding the "that portion" language in the commentary to the actual provision. Approval of this proposal is consistent with the means of egress philosophy contained in the 2012 IBC and will result in the more consistent interpretation and application of fundamental means of egress design provisions.

Cost Impact: This code change proposal will not increase the cost of construction.

E17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1004.1.1.2-E-BAJNAI-BCAC.docx

E18 – 12

Table 1004.1.2 (IFC [B] Table 1004.2)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

TABLE 1004.1.2 (IFC [B] TABLE 1004.1.2)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANCY

FUNCTION OF SPACE	OCCUPANCY LOAD FACTOR
Mercantile	
~~Areas on other floors~~	~~30 gross~~
~~Basement and grade floor areas~~	~~60 gross~~
Primary floors of the retail space[b]	30 gross
Floors and mezzanine other than the primary floors	60 gross
Storage, stock, shipping areas	300 gross

(Portions of table and notes not shown remain unchanged.)

b. The primary floor is the entry floor of the retail space. More than one floor will be considered a primary floor where customer entry from outside the retail space can occur on different levels. Other floors are secondary floors, mezzanines, and basements that customers can only access once inside the retail space.

Reason: It has never been made clear if the grade floor is the 1st floor of the retail space, or only those floors at grade. What about retails spaces that are on the 2nd floor of a strip center or mall? Is it assumed that they will not be as crowded as a retail space on the 1st floor? What if there are two grade floors? Why does a basement level have the same occupant load as the "grade floor."
This revision is provided to hopefully clarify the requirement. At least provide better clarification in the commentary.

Cost Impact: This code change proposal will not increase the cost of construction.

E18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1004.1.2-E-Godwin.doc

E19 – 12
1004.2 (IFC [B] 1004.2)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

1004.2 (IFC [B] 1004.2) Increased occupant load. The *occupant load* permitted in any building, or portion thereof, is permitted to be increased where approved by the *building official* from that number established for the occupancies in Table 1004.1.2, provided that all other requirements of this ~~the~~ code or any other applicable codes are also met based on such modified number and the *occupant load* does not exceed one occupant per 7 square feet (0.65 m^2) of net occupiable floor space.

In making the decision, the *building official* shall be permitted to consider such issues as:

1. Is this a temporary or permanent increase;
2. The function and operation of the business;
3. Openness of egress flow;
4. Management control of crowd and evacuation issues;
5. The effect of seating or tables on the egress path;
6. Is alcohol present.

After review, the *building official* shall be permitted to require a lesser density.

Where required by the *building official*, an approved aisle, seating or fixed equipment diagram substantiating any increase in *occupant load* shall be submitted. Where required by the *building official*, such diagram shall be posted.

Reason: As written, the 1:7 seems automatic if extra exits and width are provided. Some designers have felt that it is automatic and expressed opposition when other factors were brought into the evaluation. However, there are many issues that should be considered in evaluating the increase. Only a few are listed.

There is a difference in increasing the occupant load for rooms used for code hearings than rooms used as a night club, with low lights and patrons consuming alcohol. To allow an occupant load increase requires a different evaluation.

Also, there are other codes that are affected as well. An occupant load increase may change the alarm specifications, the restroom requirements, the fresh air requirements, etc. All of these factors are part of the evaluation.

Cost Impact: This code proposal will not increase the cost of construction since no extra construction costs are involved.

E19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1004.2-E-Godwin.doc

E20-12/13

1005.1, 1005.3.1, 1005.3.2, 1028.6, 1028.6.1, 1028.6.2, Table 1028.6.2, 1028.6.2.1, 1028.6.3 (IFC [B] 1005.1, 1005.3.1, 1005.3.2, 1028.6, 1028.6.1, 1028.6.2, Table 1028.6.2, 1028.6.2.1, 1028.6.3)

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

1005.1(IFC [B] 1005.1) General. All portions of the means of egress system shall be sized in accordance with this section.

> **Exception:** ~~Means of egress~~ Aisles and aisle accessways in rooms or spaces used for assembly purposes complying with Section 1028.

1005.2 (IFC [B] 1005.2) Minimum width based on component. The minimum width, in inches, of any means of egress components shall not be less than that specified for such component, elsewhere in this code.

1005.3 (IFC [B] 1005.3) Required Capacity based on occupant load. The required capacity, in inches, of the means of egress for any room, area, space or story shall not be less than that determined in accordance with the following:

1005.3.1 (IFC [B] 1005.3) Stairways. The capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inches (7.62 mm) per occupant. Where stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story.

Exceptions:

1. For other than Group H and I-2 occupancies, the capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.2 inches (5.1 mm) per occupant in buildings equipped throughout with and automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.
2. Facilities with *smoke-protected assembly seating* shall be permitted to use the capacity factors in Table 1028.6.2 indicated for aisles stairs for exit access or exit stairways where the entire path for means of egress from the seating to the exit discharge is provided with a smoke control system complying with Section 909.
3. Facilities with outdoor *smoke-protected assembly seating* shall be permitted to the capacity factors in Section 1028.6.3 indicated for aisle stairs for exit access or exit stairways where the entire path for means of egress from the seating to the exit discharge is open to the outdoors.

1005.3.2 (IFC [B] 1005.3.2) Other egress components. The capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.2 inches (5.08 mm) per occupant.

Exceptions:

1. For other than Group H and I-2 occupancies, the capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.15 inches (3.8 mm) per

occupant in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

2. Facilities with *smoke-protected assembly seating* shall be permitted to use the capacity factors in Table 1028.6.2 indicated for level or ramped aisles for means of egress components other than stairways where the entire path for means of egress from the seating to the exit discharge is provided with a smoke control system complying with Section 909.
3. Facilities with outdoor *smoke-protected assembly seating* shall be permitted to the capacity factors in Section 1028.6.3 indicated for level or ramped aisles for means of egress components other than stairways where the entire path for means of egress from the seating to the exit discharge is open to the outdoors.

1005.4 (IFC [B] 1005.4) Continuity. The capacity of the means of egress required from any story of a building shall not be reduced along the path of egress travel until arrival at the public way.

1028.6 (IFC [B] 1028.6) ~~Width~~ Capacity of ~~means of egress~~ aisle for assembly. The ~~clear width~~ required capacity of aisles ~~and other means of egress~~ shall not be less than that determined in accordance with ~~comply with~~ Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. ~~The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.~~

1028.6.1 (IFC [B] 1028.6.1) Without smoke protection. The ~~clear width~~ required capacity in inches (mm) of the ~~means of egress~~ aisles for assembly seating without smoke protection shall ~~provide sufficient capacity~~ not be less than the occupant load served by the egress element in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of aisle width for each occupant served shall be provided on aisle stairs having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional aisle ~~stair~~ width for each occupant shall be provided for each aisle stair with 0.10 inch (2.5mm)of riser height above 7 inches (178 mm).
3. Where egress requires aisle stair descent, at least 0.075 inch (1.9 mm) of additional aisle width for each occupant shall be provided on those portions of aisle stair width having no handrail within a horizontal distance of 30 inches (762 mm).

1028.6.2 (IFC [B] 1028.6.2) Smoke-protected seating. The ~~clear width~~ required capacity in inches (mm) of the ~~means of egress~~ aisle for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for smoke-protected assembly seating.

Exception: For an outdoor smoke-protected assembly seating with an occupant load not greater than 18,000, the ~~clear width~~ required capacity in inches (mm) shall be determined using the factors in Section 1028.6.3.

TABLE 1028.6.2 (IFC [B] TABLE 1028.6.2)
~~WIDTH OF~~ CAPACITY FOR AISLES FOR SMOKE-PROTECTED ASSEMBLY

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY SEATING	INCHES OF CLEAR WIDTH PER SEAT SERVED			
	~~Stairs and~~ Aisle ~~steps~~ stairs with handrails within 30 inches	~~Stairs and~~ Aisle ~~steps~~ stairs without handrails within 30 inches	~~Passageways, doorways and ramps~~ Flat aisles or ramped aisle not steeper than 1 in 10 in slope	~~Ramps~~ Ramped aisles steeper than 1 in 10 in slope
Equal to or less than 5,000	0.200	0.250	0.150	0.165
10,000	0.130	0.163	0.100	0.110
15,000	0.096	0.120	0.070	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.060	0.075	0.044	0.048

For SI: 1 inch = 25.4 mm.

1028.6.2.1 (IFC [B] 1028.6.2.1) Smoke control. ~~Means of egress~~ Aisles and aisle accessways serving a *smoke-protected assembly seating* area shall be provided with a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level at least 6 feet (1829 mm) above the floor of the means of egress.

1028.6.2.2 (IFC [B] 1028.6.2.2) Roof height. A smoke-protected assembly seating area with a roof shall have the lowest portion of the roof deck not less than 15 feet (4572 mm) above the highest aisle or aisle accessway.

Exception: A roof canopy in an outdoor stadium shall be permitted to be less than 15 feet (4572 mm) above the highest aisle or aisle accessway provided that there are no objects less than 80 inches (2032 mm) above the highest aisle or aisle accessway.

1028.6.2.3 (IFC [B] 1028.6.2.3) Automatic sprinklers. Enclosed areas with walls and ceilings in buildings or structures containing smoke-protected assembly seating shall be protected with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

Exceptions:

1. The floor area used for contests, performances or entertainment provided the roof construction is more than 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.
2. Press boxes and storage facilities less than 1,000 square feet (93 m2) in area.
3. Outdoor seating facilities where seating and the means of egress in the seating area are essentially open to the outside.

1028.6.3 (IFC [B] 1028.6.3) ~~Width of means of egress for~~ outdoor smoke-protected assembly seating. The ~~clear width~~ required capacity in inches (mm) of aisles ~~and other means of egress~~ shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by ~~aisles and~~ aisle stairs and multiplied by 0.06 (1.52 mm) where egress is by level aisles and ~~ramps~~ ramped aisles, ~~corridors, tunnels or vomitories~~.

Exception: The ~~clear width~~ required capacity in inches (mm) of aisles ~~and other means of egress~~ shall be permitted to comply with Section 1028.6.2 for the number of seats in the outdoor smoke-protected assembly seating where Section 1028.6.2 permits less width.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The question is a consistent application of the numbers used to calculate the capacity in inches for the required width for means of egress within and from assembly spaces. Currently the language for smoke protected seating (Section 1028.6.2 and 1028.6.3) is applicable for the capacity units for the entire means of egress; however, for non-smoke protected seating (Section 1028.6.1) the provisions appear to address only aisles within the seating area. When the capacity numbers in 1005.3 should be used is unclear. The purpose of this proposal is locate the numbers to determine capacity all in assembly facilities in Section 1005.3 for means of egress outside the seating bowl, and to have Section 1028 deal with aisles (level, stepped and ramped) within the seating areas. This will also reinforce that in order to take advantage of the lower capacity unit numbers, not only the seating area, but the means of egress route out of the building must be smoke-protected or open to the outdoors so there is limited accumulation of smoke. This would be consistent with the definition of smoke-protected seating:

SMOKE-PROTECTED ASSEMBLY SEATING. Seating served by *means of egress* that is not subject to smoke accumulation within or under a structure.

The intent is to continue to allow for facilities that provide smoke-protection for the seating bowl and the means of egress to continue to use the lower capacity numbers for determining required egress width; without adversely affecting assembly spaces that do not have smoke-protection.

Problems with the current text is that with the mix of requirements in 1028 for aisles and general means of egress for smoke protected seating, it has been interpreted that the higher capacity numbers should be used for the entire means of egress for non-smoke protected seating. A request for a formal code interpretation on this issue ended up in a deadlock.

For example:

Given a church with a balcony. The aisle stairs have a capacity unit of 0.3 (1028.6.1). Can the stairways from the balcony use the capacity unit of 0.2 (1005.3.1 Exception)? The difference could increase the minimum stairway width for stairways starting with balcony seating of 292 instead of 440.

44”/0.3 = 146 x 2 stairs = 292 occupants
44”/0.2 = 220 x 2 stairs = 440 occupants

Another example:

Consider if an assembly space exits into a multi-use building, such as a lecture hall in a college classroom building. The occupants of the lecture hall use the building stairways to egress the floor. Should the capacity numbers for the stairways be 0.2 for everyone; 0.3 for occupants form the lecture hall but 0.2 for everyone else; or 0.3 for everyone? If the last approach is chosen, one lecture hall in a university classroom/office building could have a significant impact on the stairway width for the entire building.

BCAC has code changes in dealing with aisles in 1005, 1009, 1017 and 1028 as well as a transition between aisle stairs and stairways. The intent is for all four proposals to correlate; however this change can stand by itself.

Cost Impact: This code change proposal will not increase the cost of construction.

E20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1005.1-E-Bajnai-BCAC.docx

E21 – 12
1005.5 (IFC [B] 1005.5)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

1005.5. (IFC [B] 1005.5) Distribution of egress capacity. <u>The required capacity as determined in Section 1005.3 shall be distributed approximately equally among the required exits or exit access doorways.</u> Where more than one exit, or access to more than one exit, is required, the means of egress shall be configured such that the loss of any one exit, or access to one exit, shall not reduce the available capacity to less than 50 percent of the required capacity.

Reason: Although Section 1005.3 dictates how required capacity is determined, there is no overall requirement for the distribution of egress capacity. The limitation of not reducing the available capacity to less than 50 percent of the required capacity generally ensures an approximately equal distribution of required capacity where two exits or exit access doorways are required. Where three or four exits are required from a space or story, capacity distribution can become lopsided. For example, a space with an occupant load of 1001 requires 200 inches of total exit door/exit access doorway capacity. Presently, one exit/exit access doorway could provide for 100 inches of capacity, while the remaining three required exits/exit access doorway could each be served by 3'-0" doors. Ordinarily, 250 occupants are served by 50 inches of egress capacity. Obviously, no one can predict where a fire will originate within a given space. Should one exit/exit access become blocked, the remaining components should be sized to reasonably accommodate the total occupant load of the space. Requiring the <u>approximately</u> equal distribution of required capacity will allow for flexibility in design while ensuring the reasonable apportionment of necessary egress capacity. Having a general distribution provision will assist in avoiding occupant congregation and competition for available egress capacity in an emergency situation from larger spaces.

Cost Impact: None

E21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1005.5-E-Keith-Richardson.doc

E22 – 12
1006.1 (IFC [B] 1006.1)

Proponent: Walter Vernon, representing Mazzetti Nash Lipsey Burch (walterv@mazzetti.com)

Revise as follows:

1006.1 (IFC [B] 1006.1) Illumination required. The means of egress, including the exit discharge, shall be <u>automatically controlled, or</u> illuminated at all times the building space served by the means of egress is occupied. <u>Where automatic controls are provided, the automatic control system shall fail in the on position and loss of power within the space shall energize the egress lighting.</u>

Exceptions:

1. Occupancies in Group U.
2. Aisle accessways in Group A.
3. Dwelling units and sleeping units in Groups R-1, R-2 and R-3.
4. Sleeping units of Group I occupancies.

Reason: There are two reasons for this proposed change.
1. To reduce the energy used, illuminating unoccupied areas within an occupied space
2. Ensure the lamps of the egress fixtures operate for the same duration as the non-egress fixtures, so eliminating the need to replace lamps in the same fixture or area at different times

Cost Impact: The code change proposal will not increase the cost of construction.

E22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.1-E-Vernon.doc

E23 – 12
1006.1 (IFC [B] 1006.1)

Proponents: Jack Bailey, One Lux Studio, representing The International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

1006.1 (IFC [B] 1006.1) Illumination required. The *means of egress*, including the *exit discharge*, shall be illuminated by either daylight or artificial light at all times the building space served by the *means of egress* is occupied. Lighting controls in the *means of egress* shall be configured so that the failure of any single lighting control device cannot leave any room, or any landing in a stairway, in complete darkness.

Exceptions:

1. Occupancies in Group U.
2. *Aisle accessways* in Group A.
3. *Dwelling units* and *sleeping units* in Groups R-1, R-2 and R-3.
4. *Sleeping units* of Group I occupancies.

Reason: Many designers and building code officials do not know if the code allows interior lighting to be turned off when sufficient daylight is present in the means of egress to allow for a safe and orderly evacuation of the building. However, most assume that lighting for the exterior means of egress can be turned off when sufficient daylight is present, and in fact exterior lighting is usually turned off during the day.

Because of this confusion it is quite common to see emergency lights burning continuously in daylighted interior spaces where adjacent non-emergency lights have been shut off by automatic controls to conserve energy.

There is no reason why the use of automatic controls should make it less likely that sufficient illumination is present for emergency egress, as long as control systems are designed to eliminate any single point of failure. The proposed language, “so that the failure of any single lighting control device cannot leave any room, or any landing in a stairway, in complete darkness” is similar to the language in NFPA 70 (700.16): “Emergency lighting systems shall be designed and installed so that the failure of any individual lighting element, such as the burning out of a lamp, cannot leave in total darkness any space that requires emergency illumination.”

As currently written, the code requires the lighting system to perform as described, but does not detail how this should occur. The use of automatic controls will not change this paradigm: building code officials and fire marshals will still inspect emergency lighting systems in buildings, and if these systems do not perform as required for **any** reason (power system or battery failure, burned out light bulb, bad ballast, improper wiring, or failed daylight sensor) they will require that the defect be fixed. And it is easy to verify that daylight sensor controls are functioning properly during daytime inspections: cover the photosensor, and see if the lights turn on.

Daylight sensor controls will eventually fail and need to be replaced, but their failure rate is about the same as the failure rate for ballasts, lower than the failure rate of battery packs, and much lower than the failure rate for lamps. In fact, by keeping lights off much of the time during the day the required maintenance for lamps and ballasts will be dramatically reduced, making it easier to keep the overall means of egress lighting system in working order.

Cost Impact: The code change proposal will not increase the cost of construction.

E23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.1 #2-E-Bailey.doc

E24 – 12
1006.1, 1024.5 (IFC [B] 1006.1, 1024.5)

Proponents: Jack Bailey, One Lux Studio, representing The International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

1006.1 (IFC [B] 1006.1) Illumination required. The *means of egress*, including the *exit discharge*, shall be illuminated at all times the building space served by the *means of egress* is occupied.

Exceptions:

1. Occupancies in Group U.
2. *Aisle accessways* in Group A.
3. *Dwelling units* and *sleeping units* in Groups R-1, R-2 and R-3.
4. *Sleeping units* of Group I occupancies.
5. Where occupant sensor controls are provided in the means of egress which automatically turn lights on when any occupant movement is sensed in the area served by those lights, and which keep those lights on for at least 15 minutes after the occupant motion ceases.

1024.5 (IFC [B] 1024.5) Illumination. Where *photoluminescent* exit path markings are installed, they shall be provided with the minimum *means of egress* illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied, and continuously during building occupancy.

Reason: A lot of energy is wasted lighting unoccupied means of egress.

In practice, the code is usually interpreted to mean that interior lights providing illumination in the means of egress cannot ever be turned off. We believe that the code should specifically allow the use of occupant sensors to control these lights.

There is precedent for this in NFPA 101 (2012), Section 7.8.1.2.2 which specifically allows the use of occupant sensor controls, but which provides a list of requirements for those sensors which no products currently on the market comply with.

There is no reason why the use of occupant sensor controls should make it less likely that sufficient illumination is present for evacuation of the building during emergencies, as long as control systems are designed to eliminate any single point of failure. The proposed language, "so that the failure of any single lighting control device cannot leave any room, or any landing in a stairway, in complete darkness" is similar to the language in NFPA 70 (700.16): "Emergency lighting systems shall be designed and installed so that the failure of any individual lighting element, such as the burning out of a lamp, cannot leave in total darkness any space that requires emergency illumination."

As currently written, the code requires the lighting system to perform as described, but does not detail how this should occur. The use of occupant sensor controls will not change this paradigm: building code officials and fire marshals will still inspect emergency lighting systems in buildings, and if these systems do not perform as required for **any** reason (power system or battery failure, burned out light bulb, bad ballast, improper wiring, or failed occupant sensor) they will require that the defect be fixed. It is easy to verify that occupant sensor controls are functioning properly during inspections: if you are in the space and the lights are off, then the occupant sensor is not working.

Occupant sensor controls will eventually fail and need to be replaced, but their failure rate should be about the same as the failure rate for ballasts, lower than the failure rate of battery packs, and much lower than the failure rate of lamps. In fact, by keeping lights off much of the time the maintenance required for lamps and ballasts will be dramatically reduced, making it easier to keep the overall means of egress lighting system in working order.

The revisions to Section 1024.5 are necessary so that occupant sensor controls **are not** used to control means of egress illumination that is used to charge photoluminescent exit path markings.

Illumination sources for photoluminescent, internally illuminated, and externally illuminated exit signs are already required to operate continuously (Sections 1011.5 and 1011.6), so this proposal will have no impact on exit signs. And likewise there will be no impact on required directional path markings in Special Amusement Buildings (Section 411.7) since these have their own separate lighting requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

E24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.1 #1-E-Bailey.doc

E25-12
1006.1.1 (New) [IFC [B] 1006.1.1(New)]

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Add new text as follows:

1006.1.1 (IFC [B] 1006.1.1) Occupancy sensors. Occupancy sensors shall be permitted to activate the required illumination for the means of egress provided they meet all of the following conditions:

1. The occupancy sensors operate as fail safe devices when the occupancy sensor fails;
2 Where the occupancy sensor is activated by an occupant the area served is illuminated for a minimum duration of 15 minutes;
3. The occupancy sensor operates as a fail safe device in the event of a power supply failure to the emergency lighting system required by Section 1006.3.
4. The means of egress is not required to have illumination to charge luminous egress path markings in accordance with Section 1024.5

Reason: This change permits the use of occupancy sensors which has been allowed in some jurisdictions. It also helps reduce energy as mandated by DOE. There are several proposals from the Adhoc Health Care Committee dealing with Section 1006. The proposals can be accepted individually, however, the proposals can work together.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

Cost Impact: None

E25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.1-E-Williams-Adhoc.docx

E26 – 12
1006.2 (IFC [B] 1006.2)

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The *means of egress* illumination level shall not be less than 1 footcandle (11 lux) at the walking surface. <u>The illumination level at an elevator landing shall not be less than 10 footcancles (100 lux) measured at the elevator sill.</u>

> **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 footcandle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.

Reason: IBC 3001.2 adopts ASME A17.1 for the design construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components. ASME A17.a states, "**ASME A17.1, 2.11.10.2 Illumination at Landing Sills.** The building corridors shall be so lighted that the illumination at the landing sills, when an elevator is in service, shall be not less than 100 lx (10 fc)". At present, the IBC does not address this minimum illumination requirement using normal power.

Cost Impact: The code change proposal will not increase the cost of construction.

E26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2-E-DAHMEN.doc

E27-12
1006.2, 1024.5 (IFC [B] 1006.2, 1024.5)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The *means of egress* illumination level shall not be less than 1 foot-candle (11 lux) at the walking surface. The *means of egress* illumination level shall not be less than 10 foot-candle (110 lux) at the walking surface where luminous egress path markings are required by Section 1024.1.

> **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 foot-candle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.

1024.5 (IFC [B] 1024.5) Illumination. Where *photoluminescent* exit path markings are installed they shall be provided with the minimum *means of egress* illumination required by Section ~~1006~~ 1006.2 for at least 60 minutes prior to periods when the building is occupied.

Reason: The change to Section 1006.2 is the light level needed to charge approved luminous markings. The change to 1024.5 is coordination with lighting levels required in 1006.2 and more specific pointer for this unique area.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

Cost Impact: The code change proposal should not increase the cost of construction because compliance with the standard is already required by facility licensure requirements.

E27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2-E3-Williams-Adhoc.docx

E28 – 12
1006.2, 1024.5 (IFC [B] 1006.2, 1024.5)

Proponent: Glenn Heinmiller, Lam Partners Architectural Lighting Design representing self (glenn@lampartners.com)

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The *means of egress* illumination level shall not be less than ~~1 footcandle (11 lux) at the walking surface~~ an average of 1 footcandle (11 lux) and not less than of 0.2 footcandle (2 lux) at any point. The illumination level shall be measured along the path of egress at floor level. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

> **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 footcandle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.

1024.5 (IFC [B] 1024.5) Illumination. Where *photoluminescent* exit path markings are installed, they shall be provided with ~~the minimum *means of egress* illumination required by Section 1006~~ not less than 1 footcandle (11 lux) of illumination for at least 60 minutes prior to periods when the building is occupied, and continuously during building occupancy.

Reason: The code should specify the minimum amount of illumination required for people to safely egress from buildings during an emergency. Requiring more light than is necessary reduces the energy efficiency of buildings, and is in direct conflict with the energy saving goals of the IECC and IGCC.

1. European Norm EN 1838 (Emergency Lighting) requires a **minimum** of 1 lux (0.1 footcandle) for safety lighting in escape routes, and a **minimum** of 0.5 lux (0.05 footcandles) of anti-panic lighting. The maximum-to-minimum uniformity ratio must be less than 40 to 1.
2. The Ninth Edition of the IESNA Handbook recommends a **minimum** of 0.1 footcandle in the means of egress, with a maximum-to-minimum uniformity ratio less than 40 to 1.
3. Section 1006.3.1 requires that an **average** of 1 footcandle and a **minimum** of 0.1 footcandle be provided at the beginning of an emergency involving the loss of normal power. The maximum-to-minimum uniformity ratio must be less than 40 to 1.
4. NFPA 101 (7.9.2.1) also requires that an **average** of 1 footcandle and a **minimum** of 0.1 footcandle be provided at the beginning of an emergency involving the loss of normal power. The maximum-to-minimum uniformity ratio must be less than 40 to 1.

This proposal would reduce the amount of illumination required in means of egress from a minimum of 1.0 footcandle to a minimum of 0.2 footcandle, which should still be twice as much light as we need, based on the references cited above.

Cost Impact: The code change proposal will not increase the cost of construction.

E28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2 #1-E-Heinmiller.doc

E29 – 12
1006.2 (IFC [B] 1006.2)

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing self (geneb@codeconsultants.com)

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The means of egress illumination level shall not be less than 1 footcandle (11 lux) at the walking surface.

> **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances ~~to not less than 0.2 footcandle (2.15 lux),~~ <u>by one of the following methods</u> provided that the required illumination is automatically restored upon activation of a premises' fire alarm system.
>
> 1. <u>Externally illuminated walking surfaces shall be permitted to be illuminated to not less than 0.2 footcandle (2.15 lux),</u>
> 2. <u>Steps, landings and the sides of ramps shall be permitted to be marked in accordance with Sections 1024.2.1, 1024.2.2 and 1024.2.4 by systems listed in accordance with UL 1994.</u>

Reason: The exception is divided into two parts. The first is a relocation of the existing text of the exception. The second part adds the allowance for use of the self-luminous marking system already in the code in Section 1024. Because the illumination levels within an auditorium may not be brought up to sufficiently high levels between performances to charge the photoluminescent markings, only internally illuminated systems are addressed. The light levels produced would be the same as those required for the emergency egress identification provided by the markings in Section 1024. Handrail marking is not included in this proposal because it was not a part of the external illumination concept previously and because it would be distracting to individuals seated at essentially the same eye level as the handrails.

The UL standard is already included in the code. It recognizes internal illumination as one means of achieving the illumination levels desired and provides a method for assuring reliability.

Cost Impact: None

E29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2-E-Boecker.doc

E30 – 12
1006.2 (IFC [B] 1006.2)

Proponent: Glenn Heinmiller, Lam Partners Architectural Lighting Design representing self (glenn@lampartners.com)

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The *means of egress* illumination level shall not be less than 1 footcandle (11 lux) at the walking surface.

~~**Exception**~~ **Exceptions:**

1. For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 footcandle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.
2. For exterior *means of egress* the illumination at the walking surface is permitted to be reduced to not less than 0.2 footcandle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system.

Reason: The IBC should specify the minimum amount of illumination required for people to safely egress from buildings during an emergency. Requiring more light than is necessary reduces the energy efficiency of buildings, and is in direct conflict with the energy saving goals of the IECC and IGCC.

In addition to the energy used by these lighting systems, excessive exterior lighting also contributes to light trespass, which the IGCC seeks to limit.

This proposal would allow buildings with fire alarm systems to operate **exterior** means of egress lighting at a lower level of 0.2 footcandle minimum, provided that light levels automatically increase to 1.0 footcandle minimum when triggered by the fire alarm system.

Many exterior lighting applications require far less than 1.0 footcandle minimum illumination, including most pedestrian walkways. Building owners who wish to invest in a control system which allows them to operate their exterior lighting at lower levels when there is no emergency that requires evacuation of the building should be allowed to do so.

Cost Impact: The code change proposal will not increase the cost of construction.

E30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2 #2-E-Heinmiller.doc

E31 – 12
1006.2 (IFC [B] 1006.2)

Proponents: Jack Bailey, One Lux Studio, representing The International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The *means of egress* illumination level shall not be less than 1 footcandle (11 lux) at the walking surface.

Exceptions:

1. For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 footcandle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.
2. <u>For exterior *means of egress* illumination shall average not less than 1 footcandle (11 lux) and not less than of 0.1 footcandle (1 lux) at any point. The illumination level shall be measured along the path of egress at floor level. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.</u>

Reason: Exterior light levels are typically much lower than interior light levels, and this should be recognized by the code.

The code requires that all exit discharges be illuminated to the public way, or to a safe dispersal area on the building site, with illumination levels as specified in Section 1006.2. For larger buildings or campuses distant from a public way, this can mean hundreds of feet of exterior pathways that are required to be illuminated at all times the building is occupied.

It is good that emergency illumination is required for exterior means of egress, but the illumination requirement must be appropriate.

The proposed light levels are copied from 1006.3.1, and we would suggest that if this is sufficient light for a safe and orderly evacuation of the building when normal power is lost, it should also be sufficient when normal power is available.

Excessive exterior lighting is problematic for several reasons:

1. It wastes energy.
2. It encourages overlighting for other areas of the site (because you may not want an infrequently used egress path to be the brightest area on site), which wastes even more energy.
3. It contributes to light pollution, which has been shown to harm both human and animal health.

Cost Impact: The code change proposal will not increase the cost of construction.

E31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2 #1-E-Bailey.doc

E32 – 12
1006.2.1, 1006.3.1 (IFC [B] 1006.2.1, 1006.3.1)

Proponents: Jack Bailey, One Lux Studio, representing The International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

1006.2 (IFC [B] 1006.2) Illumination level. The *means of egress* illumination level shall ~~not be less than 1 footcandle (11 lux) at the walking surface~~ average not less than of 1 footcandle (11 lux) and not less than 0.1 footcandle (1 lux) at any point. The illumination level shall be measured along the path of egress at floor level. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

> **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.1 footcandle (1 lux)~~0.2 footcandle (2.15 lux)~~, provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.

1006.3.1 (IFC [B] 1006.3.1) Illumination level under emergency power. Emergency lighting facilities shall be arranged to provide initial illumination in accordance with Section 1006.2.~~that is at least an average of 1 footcandle (11 lux) and a minimum at any point of 0.1 footcandle (1 lux) measured along the path of egress at floor level~~. Illumination levels shall be permitted to decline to 0.6 footcandle (6 lux) average and a minimum at any point of 0.06 footcandle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

Reason: IBC 2012 has two different standards for light levels in the means of egress, which is confusing to many people. Under normal power, a **minimum** of 1 footcandle of illumination is required. Under emergency power, an **average** of 1 footcandle of illumination is required, with a **minimum** of 0.1 footcandle. This proposal would simplify these requirements to require one light level at all times. Section 1006.3.1 is still required, to allow illumination levels from battery powered lighting equipment to decline as the batteries run down.

We do not believe that this proposal will have any impact on photoluminescent or externally illuminated exit signs (Sections 1011.5 and 1011.6.2), or directional path markings in Special Amusement Buildings (Section 411.7) since these have their own separate lighting requirements.

We believe that this change is necessary for several reasons:

First, the current code allows light levels to decline by up to 90% at the start of an emergency that involves loss of normal power, and this is a time when people are likely to panic. Keeping light levels consistent at the beginning of an emergency should enhance safety.

Second, we believe that the current IBC requirement for an average of 1 footcandle and a minimum of 0.1 footcandle under emergency power is sufficient for a safe and orderly evacuation of the building, so why should more light be required under normal operating conditions?

Third, 1 footcandle minimum illumination is excessive for many types of uses. Most bars, night clubs, and fine dining restaurants do not provide 1 footcandle minimum illumination because it is inappropriately high. Most movie theaters do not provide a minimum of 0.2 footcandle in aisles during projections for the same reason. And most exterior lighting applications require less than a minimum of 1.0 footcandle. We would rather see a reasonable requirement consistently complied with than an unreasonable requirement regularly ignored.

And finally, higher light levels have an environmental impact. Excessive lighting wastes energy. And when emergency light fixtures are provided with integral battery packs (which is the most common solution in many jurisdictions), those battery packs always contain either lead or cadmium, which are toxic, and they often end up in municipal landfills because of improper disposal.

It is vitally important that buildings are provided with sufficient illumination to allow a safe and orderly evacuation during emergencies. But excessive lighting does not improve safety, and does harm the environment.

Cost Impact: The code change proposal will not increase the cost of construction.

E32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2 #2-E-Bailey.doc

E33-12
1006.2.1 (New), 1006.3.1 [IFC [B] 1006.2.1(New), 1006.3.1]

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

<u>**1006.2.1 (IFC [B] 1006.2.1) Exit discharge.** In Group I-2 occupancies, at the exit discharge, exterior landings as required by Section 1008.1.6 for *exit discharge* doorways in buildings required to have two or more *exits*, failure of any single lighting unit shall not reduce the illumination level to less than 1 foot-candles (11 lux).</u>

1006.3.1 (IFC [B] 1006.3.1) Illumination level under emergency power. Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded. <u>In Group I-2 occupancies, failure of any single lighting unit shall not reduce the illumination level to less than 0.2 foot-candles (2.2 lux).</u>

Reason: The intent of new Section 1006.2.1 is to assure that the failure of a single lighting unit will not comprise the minimum lighting levels needed to safely egress during exit discharge.

The revision in Section 1006.3.1 is to assure performance of the lighting system during an emergency. The requirement creates a level of redundancy needed to assure lighting levels.

The limitation to Group I-2 is due to the scope of the Adhoc Health committee. There are no reasons why this would not be a good change for a majority of occupancies.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

Cost Impact: None

E33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.2.1-E-Williams-Adhoc.docx

E34 – 12
1006.3 (IFC [B] 1006.3)

Proponent: Gene Boecker, Code Consultants, Inc., representing self (geneb@codeconsultants.com); Maureen Traxler, City of Seattle Department of Planning and Development, representing City of Seattle Department of Planning and Development (maureen.traxler@seattle.gov)

Revise as follows:

1006.3 (IFC [B] 1006.3) Emergency power for illumination. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

1006.3.1 (IFC [B] 1006.3.1) Rooms and spaces. In the event of power supply failure, in rooms and spaces that require two or more means of egress an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles ~~and unenclosed egress stairways~~ ~~in rooms and spaces that require two or more means of egress~~.
2. Corridors~~, interior exit stairways and ramps and exit passageways in buildings required to have two or more exits~~.
3. Exit access stairways and ramps

1006.3.2 (IFC [B] 1006.3.2) Buildings. In the event of power supply failure, in buildings that require two or more means of egress, an emergency electrical system shall automatically illuminate all of the following areas:

1. Interior exit access stairways and ramps
2. Interior and exterior exit stairways and ramps
3. Exit passageways
4. ~~3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.~~
5. 4. ~~Interior exit discharge elements~~ Vestibules and areas on the level of discharge used for exit discharge in accordance with~~, as permitted in~~ Section 1027.1, ~~in buildings required to have two or more exits~~.
6. 5. Exterior landings as required by Section 1008.1.6 for exit ~~discharge~~ doorways that lead directly to the exit discharge ~~in buildings required to have two or more exits~~.

1006.3.3 (IFC [B] 1006.3.3) Duration. The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

~~1006.3.1~~ 1006.3.4 (IFC [B] ~~1006.3.1~~ 1006.3.4) Illumination level under emergency power. *(no change)*

Reason: This proposal corrects a small glitch in the 2012 code, and is otherwise editorial. The glitch is that a space for which two means of egress are required might not have an aisle or corridors, for example a gymnasium or horse practice arena. Therefore, Section 1006.3 would not require emergency lighting. The provision that requires emergency lighting when two or more exits are required is moved out of the list so that all such spaces will have emergency lighting. In addition, the proposal updates the terminology used for stairways and ramps.

Cost Impact: None

E34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.3.1(new)-E-Boecker-Traxler.doc

E35 – 12
1006.3 (IFC [B] 1006.3)

Proponent: Wesley Walters (hww@clarkcountynv.gov)

Revise as follows:

1006.3 (IFC [B] 1006.3) Illumination emergency power. The power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. *Aisles* and unenclosed egress *stairways* in rooms and spaces that require two or more *means of egress*.
2. *Corridors*, *exit enclosures* and *exit passageways* in buildings required to have two or more *exits*.
3. Exterior egress components at other than their *levels of exit discharge* until *exit discharge* is accomplished for buildings required to have two or more *exits*.
4. Interior *exit discharge* elements, as permitted in Section 1027.1, in buildings required to have two or more *exits*.
5. Exterior landings as required by Section 1008.1.6 for *exit discharge* doorways in buildings required to have two or more *exits*.
6. Electrical equipment rooms, fire command centers, fire pump rooms and generator rooms.
7. Public restrooms with an area greater than 300 square feet (27.87 m^2).

Reason: The new exception 6 - In the event of an emergency and the lighting is lost you need to track down the problem and maintain emergency equipment. The expansion of areas to include the emergency equipment provides a higher level of safety for those trying to resolve problems with the system failure.

The new exception 7 - large bathrooms are designed without natural light yet may have many doors (stalls), twists and turns that leave groups of people in a compromised situation with no ability to determine how to get out in an emergency.

Cost Impact: The code change proposal will increase the cost of construction

E35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.3-E-WALTERS

E36-12
1007.1 (IFC [B] 1007.1)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. *Accessible means of egress* shall comply with this section. *Accessible* spaces shall be provided with not less than one *accessible means of egress*. Where more than one *means of egress* are required by Section 1015.1 or 1021.1 from any *accessible* space, each *accessible* portion of the space shall be served by not less than two *accessible means of egress*.

Exceptions:

1. *Accessible means of egress* are not required to be provided in ~~alterations to~~ existing buildings.
2. One *accessible means of egress* is required from an *accessible mezzanine* level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped *aisles*, one *accessible means of egress* is permitted where the common path of travel is *accessible* and meets the requirements in Section 1028.8.

Reason: The intent is to revise Section 1007.1 for consistency with the language in IBC 3411.6,and IEBC 410.6 and 705.

1. The language in these three sections reads as follows:
2. Accessible means of egress required by Chapter 10 of the *International Building Code* are not required to be provided in existing *facilities*.

The text in 1007.1 could be read to require accessible means of egress in existing buildings undergoing a change or occupancy. While there may be situations where accessible means of egress should be provided in existing buildings, this must be addressed separately. It was not the intent of the provisions in the four sections in the IBC and IEBC to have different requirements.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.1-E-BALDASSARRA-CTC.docx

E37 – 12
1007.1 (IFC [B] 1007.1)

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing self (geneb@codeconsultants.com)

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.
4. <u>Accessible means of egress are not required from levels of parking garages that do not contain accessible parking spaces.</u>

Reason: According to Section 1105.1.1 and 1106.6 of the IBC, accessible parking is required on levels that have a direct connection to the building. Van accessible parking is allowed to be limited to the ground floor level. Hence accessible parking is not required on all levels of a parking garage.

It is often unclear whether an accessible means of egress, once provided for the accessible parking spaces within a garage on a single level, should be applied throughout the structure. Because the intent for accessible means of egress is to provide access for individuals with mobility disabilities, this would not be necessary on parking garage levels without accessible parking spaces.

Section 1007.2.1 of the IBC requires an elevator to serve as an accessible mean of egress in buildings where a required accessible floor is more than four stories above the level of exit discharge (a five story building). While accessible parking is not required on the upper levels of a garage (without access to the building on those levels) that does not mean that the upper levels are not to be designed for accessibility. It simply means that they are not required to be designed for mobility disabilities. The floors must still be designed for other types of disabilities. Protruding objects/headroom obstructions are still required to be addressed for visual disabilities and a telephone bank would need to provide units for the hearing impaired. Tactile exit signs are unaffected by this proposal because they are required under Section 1011.4 and are not a part of the accessible means of egress provisions in Section 1007.

Similarly, although the code contains an exemption for areas of refuge for parking garages, a 48 inch clear width between handrails would still be required since an open parking garage is usually without sprinklers. The purpose of the 48 inch clear width is to facilitate fire fighter capability to carry a wheelchair down the stairs. If there is no accessible parking on the upper levels, this too should not be a requirement.

While accessible parking may be provided on multiple levels because building entrances are provided at various levels, full compliance should not be necessary at levels where mobility accessibility is not an issue. If accessible parking is provided on all levels, then the accessible means of egress should be provided on all levels as well. However, if accessible parking is provided on only the grade level of an eight-level parking garage, the requirements for an accessible means of egress elevator should not apply and the stairways serving the upper levels should be designed based on required capacity rather than a blanket 48 inch between handrail requirement.

Cost Impact: The code change proposal will reduce the cost of construction in some instances.

E37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.1 #2-E-Boecker.doc

E38-12
1007.3 (IFC [B] 1007.3)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an *accessible means of egress*, a *stairway* between stories shall have a clear width of 48 inches (1219 mm) minimum between *handrails* and shall either incorporate an *area of refuge* within an enlarged floor-level landing or shall be accessed from either an *area of refuge* complying with Section 1007.6 or a *horizontal exit*. *Exit access stairways* that connect levels in the same story are not permitted as part of an *accessible means of egress*.

Exceptions:

1. Areas of refuge are not required at exit access stairways where a two-way communication is provided at the elevator landing in accordance with Section 1007.8.
2~~1.~~ The clear width of 48 inches (1219 mm) between *handrails* is not required in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3~~2.~~ *Areas of refuge* are not required at *stairways* in buildings equipped throughout by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4~~3.~~ The clear width of 48 inches (1219 mm) between *handrails* is not required for *stairways* accessed from a *horizontal exit*.
5~~4.~~ *Areas of refuge* are not required at *stairways* serving *open parking garages*.
6~~5.~~ *Areas of refuge* are not required for smoke protected seating areas complying with Section 1028.6.2.
7~~6.~~ The *areas of refuge* are not required in Group R-2 occupancies.

Reason: In an unsprinklered building with unenclosed exit access stairways permitted between stories an area of refuge is require to serve the stairway, which will result in a closet type area of refuge at the top of the stairway with two-way communication inside. At this location, the area of refuge would not be connected to a stairway enclosure, and there is a real chance that it will end up being used as a closet. From a technical point of view, where do you put this area of refuge in relation to the open exit access stairway and how close does it have to be to the open stairway? Does the stair have to be enclosed because of the connection requirements in 1007.3? Since the two-way communication is now required at the elevator lobby it would be more logical to allow the occupants with mobility impairments to move to the elevator landing and use that communication device and move them away from the open stairway.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.3-E-BALDARRASSA-CTC.docx

E39-12
1007.3, 1007.4 (IFC [B] 1007.3, 1007.4)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an *accessible means of egress*, a *stairway* between stories shall have a clear width of 48 inches (1219 mm) minimum between *handrails* and shall either incorporate an *area of refuge* within an enlarged floor-level landing or shall be accessed from ~~either~~ an *area of refuge* complying with Section 1007.6 ~~or a *horizontal exit*~~. *Exit access stairways* that connect levels in the same story are not permitted as part of an *accessible means of egress*.

Exceptions:

1. The clear width of 48 inches (1219 mm) between *handrails* is not required in buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. *Areas of refuge* are not required at *stairways* in buildings equipped throughout by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. The clear width of 48 inches (1219 mm) between *handrails* is not required for *stairways* ~~accessed from a *horizontal exit*~~ from a refuge area in conjunction with a horizontal exit.
4. *Areas of refuge* are not required at *stairways* serving *open parking garages*.
5. *Areas of refuge* are not required for smoke protected seating areas complying with Section 1028.6.2.
6. ~~The~~ *Areas of refuge* are not required at stairways in Group R-2 occupancies.
7. *Areas of refuge* are not required at *stairways* in *Group I-3 facilities*.
8. Areas of refuge are not required for stairways accessed from a refuge area in conjunction with a horizontal exit.

1007.4 (IFC [B] 1007.4) Elevators. In order to be considered part of an *accessible means of egress*, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Chapter 27 and Section 3003. The elevator shall be accessed from either an *area of refuge* complying with Section 1007.6 or a *horizontal exit*.

Exceptions:

1. ~~Elevators are not required to be accessed from an *area*~~ *Areas of refuge* ~~or *horizontal exit*~~ *are not required at the elevator* in *open parking garages*.
2. *Areas of refuge* are not required at elevators in *Group I-3 facilities*.

3~~2.~~ ~~Elevators are not required to be accessed from an *area*~~ *Areas of refuge* ~~or *horizontal exit* in~~ are not required in buildings and facilities equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

4~~3.~~ Areas of refuge are not required at Elevators not required to be located in a shaft in accordance with Section 712 ~~are not required to be accessed from an *area of refuge* or *horizontal exit*~~.

5~~4.~~ Areas of refuge are not required at Elevators ~~are not required to be accessed from an *area of refuge* or *horizontal exit* for~~ serving smoke protected seating areas complying with Section 1028.6.2.

6. Areas of refuge are not required for elevators accessed from a refuge area in conjunction with a horizontal exit.

Reason: This proposal is for the most part editorial and makes the language in the exceptions consistent. There is with one new items added and one relocation for added clarity.

"Areas of refuge are not required at stairways/elevators in Group I-3 facilities" is a new exception to coordinate with the DOJ 2010 ADA Standards for Accessible Design. The Department of Justice (ADA 207.2 Exception 2) had concerns that areas of refuge could pose security risks in correctional facilities due to their enclosed nature, and a building designer has the option of locating a facility's accessible spaces such that an elevator need never be used as part of an accessible means of egress.

" Areas of refuge are not required for stairways/elevators accessed from a refuge area in conjunction with a horizontal exit" clarifies that a redundant area of refuge is not needed immediately adjacent to the elevator where a refuge area and horizontal exit to the elevator are provided.

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Cost Impact: None

E39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.3 #2-E-BALDASSARRA-CTC.docx

E40 – 12
1007.4 (IFC [B] 1007.4)

Proponent: Brian Black, BDBlack Codes, Inc representing National Elevator Industry Inc. (bdblack@neii.org)

Revise as follows:

1007.4 (IFC [B] 1007.4) Elevators. ~~In order to be considered~~ Where elevators are part of an accessible means of egress, ~~an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. S~~standby power shall be provided in accordance with Chapter 27 and Section 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Elevators not required to be located in a shaft in accordance with Section 712 are not required to be accessed from an area of refuge or horizontal exit.
4. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1028.6.2.

Reason: All new elevators must comply with the emergency operation and signalling device requirements of Section 2.27 of ASME A17.1 so this language is unnecessary. See Section 3001.2

Cost Impact: None

E40-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.4-E-Black.doc

E41-12
1007.5 (IFC [B] 1007.5)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1007.5 (IFC [B] 1007.5) Platform lifts. Platform ~~(wheelchair)~~ lifts shall ~~not~~ be permitted to serve as part of an accessible means of egress~~, except~~ where allowed as part of a required accessible route in Section 1109.8~~, Items 1 through 9~~ except for Item 10. Standby power for the platform lift shall be provided in accordance with Chapter 27 ~~for platform lifts permitted to serve as part of a means of egress~~.

Reason: This is an editorial cleanup of this existing requirement. With the current language people often interpret Item "1 through 9" as a typo instead of not allowing #10. The reason to change "items 1 through 9 [excepting 10]" to specifically exempting Item 10 is to clarify that it is not appropriate to permit a platform lift installed due to exterior site constraints to serve as assessable means of egress. Whereas Items 1 through 9 in Section 1109.8 address very small spaces with minimal occupant loads, Item 10 would permit a platform lift to serve as an accessible route into a health care facility, senior apartment building, assisted loving project, and other occupancies that may hold dozens of persons who need an accessible means of egress from the facility. The slow speed and long cycling time of a platform lift would make its use as an accessible means of egress for more than a few persons impracticable in an emergency.

The remaining changes are editorial cleanup. (ADA 207.2)

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Cost Impact: None

E41-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.5-E-BALDASSARRA-CTC.docx

E42 – 12
1007.5 (IFC [B] 1007.5)

Proponent: Jerome Seville, Commonwealth of Pennsylvania representing self (Jseville@pa.gov)

Revise as follows:

1007.5 (IFC [B] 1007.5) Platform lifts. Platform (wheelchair) lifts shall not serve as part of an *accessible means of egress*, except where allowed as part of a required *accessible route* in Section 1109.8, Items 1 through 9. <u>Platform lifts permitted to serve as part of an accessible route by Item 10 in Section 1109.8 shall not serve as part of an accessible means of egress for Group I-1 or I-2 facilities or where the exit will serve more than 200 occupants.</u> Standby power shall be provided in accordance with Chapter 27 for platform lifts permitted to serve as part of a *means of egress*.

Reason: There will be occupancies, even in new construction, where the only practical means of access into the structure will be by a wheelchair lift. With the entrance constituting one of the means of egress, it would be beneficial to allow the use of the lift to exit.

Assisted living facilities, hospitals and nursing homes (Groups I-1 and I-2) have a higher excepted number of people that may have difficulty with stairways. The occupancy limit of 200 for other occupancies is being based upon IBC Section 1007.6.1, where it is being assumed that there will be one wheelchair individual per 200 occupants; thus only one wheelchair in the area being evacuated by the lift.

Cost Impact: None

E42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.5-E-Seville.doc

E43-12
1007.5.1 (IFC [B] 1007.5.1)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Delete without substitution:

~~**1007.5.1 (IFC [B] 1007.5.1) Openness.** Platform lifts on an accessible means of egress shall not be installed in a fully enclosed hoistway.~~

Reason: The intent of this proposal is to delete this requirement for platform lifts that serve as part of the accessible means of egress. The platform lift safety standard, ASME A18.1, has been revised to allow for platform lifts to penetrate a floor. Vertical openings are required in the IBC to be protected in accordance with Section 712. Platform lifts permitted as part of the accessible route into as space are addressed in ADA 207.2 and IBC 1109.8. While most are for a change in elevation that would not penetrate a floor, some provisions, such as non-public areas with 5 or fewer occupants, may involve a floor penetration.

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Cost Impact: None

E43-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.5.1-E-BALDASSARRA-CTC.docx

E44 – 12
1007.5.1 (IFC [B] 1007.5.1)

Proponent: Jerome Seville, Commonwealth of Pennsylvania representing self (Jseville@pa.gov)

Revise as follows:

1007.5.1 (IFC [B] 1007.5.1) Openness. Platform lifts on an *accessible means of egress* shall not be installed in a fully enclosed hoistway.

> <u>**Exception:** Platforms lifts shall be permitted to be installed in a fully enclosed hoistway where a two-way communication system complying with Section 1007.8 is provided at the platform lift landings at other than the level of exit discharge.</u>

Reason: ASME A18.1now allow lifts to penetrate a floor line which in turn would most likely require a shaft.

Cost Impact: Nominal $600.00 for a two-way communication system.

E44-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.5.1-E-Seville.doc

E45-12
1007.6, 1007.6.2 (IFC [B] 1007.6, 1007.6.2)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress.

<u>**1007.6.1 (IFC [B] 1007.6.1) Travel distance.**</u> The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1.

<u>**1007.6.2 (IFC [B] 1007.6.2) Stairway or elevator access.**</u> Every required area of refuge shall have direct access to a stairway ~~within an exit enclosure~~ complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4. ~~Where an elevator lobby is used as an area of refuge , the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.~~

~~1007.6.1~~ <u>1007.6.3</u> (IFC [B] ~~1007.6.1~~ <u>1007.6.3</u>) Size. *(no change)*

~~1007.6.2~~ <u>1007.6.4</u> (IFC [B] ~~1007.6.2~~ <u>1007.6.4</u>) Separation. Each *area of refuge* shall be separated from the remainder of the story by a *smoke barrier* complying with Section 709 or a *horizontal exit* complying with Section 1025. Each *area of refuge* shall be designed to minimize the intrusion of smoke.

> **Exception:** *Areas of refuge* located within an enclosure for *exit access stairways* or *interior exit stairways* <u>*complying with Section 1009.3 or Section 1022*</u>.

~~1007.6.3~~ <u>1007.6.5</u> (IFC [B] ~~1007.6.3~~ <u>1007.6.5</u>) Two-way communication. *(no change)*

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC’s study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies**,** with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study, 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

This proposal is intended to correlate the area of refuge elevator lobby requirements with other related elevator lobby requirements. This section currently requires that when an enclosed elevator lobby is used as an area of refuge that the lobby and the hoistway be protected as a smokeproof enclosure. Reference to the smoke proof enclosure requirements seemed inappropriate as they are focused upon stairs and would not be practical to apply to elevator lobbies. For instance it is unclear if an enclosed elevator lobby would be required to have a vestibule. Also if the pressurization option is chosen the criteria and requirements are focused upon stairs not elevator hoistway pressurization. The solution was to simply rely on the separation required for areas of refuge in general as that was the original intent of the requirement.

See discussion on CTC elevator lobby proposal coordination in code changes to Section 713.14.

Cost Impact: None

E45-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.6-E-BALDASSARRA-CTC.docx

E46 – 12
1007.2, 1007.6.2, 1007.7, 1007.7.1, 1007.7.2 (IFC [B] 1007.2, 1007.6.2, 1007.7, 1007.7.1, 1007.7.2)

Proponent: Ron Clements, Chesterfield County Building Inspection Department representing self (clementsro@chesterfield.gov)

Revise as follows:

1007.2 (IFC [B] 1007.2) Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Interior exit access stairways complying with section s 10007.3 and 1009.3.
4. Exterior exit stairways complying with Sections 1007.3 and 1026 and serving levels other than the level of exit discharge.
5. Elevators complying with Section 1007.4.
6. Platform lifts complying with Section 1007.5.
7. Horizontal exits complying with Section 1025.
8. Ramps complying with Section 1010.
9. Areas of refuge complying with Section 1007.6.
10. Exterior area for assisted rescue complying with Section 1007.7 serving exits at the level of exit discharge.

1007.6.2 (IFC [B] 1007.6.2) Separation. Each *area of refuge* shall be separated from the remainder of the story by a *smoke barrier* complying with section 710 or a *horizontal exit* complying with Section 1025. Each *area of refuge* shall be designed to minimize the intrusion of smoke.

Exceptions:

1. *Areas of refuge* located within *an exit enclosure for exit access stairways or interior exit stairways*.
2. *Areas of refuge* in outdoor facilities where exit access is essentially open to the outside.

1007.6.3 (IFC [B] 1007.6.3) Two-way communication. *(no change)*

1007.7 (IFC [B] 1007.7) Exterior area for assisted rescue. Exterior areas for assisted rescue shall be accessed by an accessible route from the area served. ~~Exterior areas for assisted rescue shall be permitted in accordance with section 1007.7.1 or 1007.7.2.~~

~~**1007.7.1 (IFC [B] 1007.7.1) Level of exit discharge.**~~ Where the exit discharge does not include an accessible route from an exit located on the level of exit discharge to a public way, an exterior area of assisted rescue shall be provided on the exterior landing in accordance with section 1007.7.3 through ~~1007.7.6~~ 1007.7.4.

~~**1007.7.2 (IFC [B] 1007.7.2) Outdoor facilities.** Where exit access from the area serving outdoor facilities is essentially open to the outside, an exterior area of assisted rescue is permitted as an alternative to an area of refuge. Every required exterior area of assisted rescue shall have direct access to an interior exit stairway, exterior stairway, or elevator serving as an accessible means of egress component. The exterior area of assisted rescue shall comply with sections 1007.7.3 through 1007.7.6 and shall be provided with a two-way communication system complying with sections 107.8.1 and 1007.8.2.~~

~~1007.7.3~~ 1007.7.1 (IFC [B] ~~1007.7.3~~ 1007.7.1)Size. *(No change to current text)*

~~1007.7.4~~ 1007.7.2 (IFC [B] ~~1007.7.4~~ 1007.7.2) Separation. *(No change to current text)*

~~1007.7.5~~ 1007.7.3 (IFC [B] ~~1007.7.5~~ 1007.7.3) Openness. *(No change to current text)*

~~1007.7.6~~ 1007.7.4 (IFC [B] ~~1007.7.6~~ 1007.7.4) Stairway. *(No change to current text)*

Reason: The purpose of this code change is to simplify the requirements for exterior area of assisted rescue and return the concept back to its original purpose as an exit discharge component. This code change also addresses outdoor facilities with regards to area of refuge and exterior area of assisted rescue requirements that were introduced into the code by code change E38-09/10. The result of code change E38-09/10 is to allow what is essentially an area of refuge to be designed with the omission of the smoke rated enclosure around the area of refuge when the area of refuge is located in a structure that is open to the outdoor air by calling it an exterior area of assisted rescue. The problem is that the exterior area for assisted rescue is a specialized accessible means of egress component that was created as an element of a grade level exit discharge, exterior of the building on the outside of the exterior wall, and it is to awkward to attempt to use the exterior area for assisted rescue section as the method to accomplish the goal of E38-09/10. That is why it took so many modifications throughout section 1007.7 to accomplish.

Another problem is that 1007.7.2 is addressing an outdoor facility where the exterior area of assisted rescue will likely be within the building perimeter and the building may not have exterior walls or even a roof. That condition raises the question of how to comply with section 1007.7.4.2 for separation. Is the intent to provide a 1 hour rated “exterior wall” within the building perimeter that may not even have a roof at which to terminate? This is further confused when the requirements for openness in 1007.7.5 are added to the question. It appears that though section 1007.7.4 for separation is referenced by 1007.7.2 as applicable, 1007.7.4 Separation is not applicable and no rating is required since there is no exterior wall to provide a separation, and since the building is open the separation is not needed.

Since the net result of the E38-09/10 change is to keep all of the aspects of an area of refuge accept the separation requirement it is cleaner and simpler to accomplish that goal with a single exception to 1007.6.1 Separation. The following are explanations for each specific change:

1007.2 item #10- “serving exits at the level of exit discharge” was added to clarify that exterior area of assisted rescue is a level of exit discharge component. Note that item or component #4 for exterior exit stairways already states that exterior exit stairs serve “levels other than the level of exit discharge”.

1007.6.2 Exception #1 and #2- The current exception was numbered one and new exception #2 was added. This new exception allows the area of refuge to be exempted from the rated separation requirements as is intended with the current 2012 code text approved through E38-09/10.

1007.7 and 1007.7.1- The language from section 1007.7.1 that addresses exterior areas of assisted rescue on the level of exit discharge has been moved up to the parent section 1007.7 since the result of this code change is that exterior areas of assisted rescue will only serve the level of exit discharge. Sub-sections 1007.7.1 and 1007.7.2 are proposed to be deleted without replacement.

1007.7.2-The provisions of section 1007.7.2 are addressed in the areas of refuge section 1007.6 with the addition of the exception proposed for 1007.6.2. The requirements and allowances of the first sentence of section 1007.7.2 are accomplished with the addition of exception #2 proposed for 1007.6.2 for areas of refuge. The requirements and allowances of the second sentence of section 1007.7.2 is accomplished with existing text in section 1007.6 for areas of refuge. The requirements of the third sentence of section 1007.7.2 are accomplished with the current provisions for area of refuge with the separation exception, which includes the size of the area and the two way communication. The stairway provisions including exception for sprinkler in 1007.7.6 are provided by the stairway requirements that exist in section 1007.3.

Cost Impact: This is strictly an editorial change with no alteration of code requirements therefore this change will not increase the cost of construction.

E46-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.2-E-Clements.doc

E47 – 12
1007.7.5 (IFC [B] 1007.7.5)

Proponent: Jerome Seville, Commonwealth of Pennsylvania representing self (Jseville@pa.gov)

Revise as follows:

1007.7.5 (IFC [B] 1007.7.5) Openness. The exterior area for assisted rescue shall be open to the outside air. The sides other than the separation walls shall be at least 50 percent open, and the open area shall be distributed so as to minimize the accumulation of smoke or toxic gases. <u>Where the floor of the exterior area for assisted rescue is at 60 inches (1,524 mm) or more below finished grade, a two-way communication system, complying with Sections 1007.8.1 and 1007.8.2 shall be provided.</u>

Reason: There are instances where an exterior area of assisted rescue is located within an areaway to a basement and a disabled individual may not be readily seen by responders.

Cost Impact: $2,000.00 to $4,000.00 for communication system

E47-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.7.1-E-Seville.doc

E48 – 12
1007.8 (IFC [B] 1007.8)

Proponent: Steve Pfeiffer representing City of Seattle, Dept of Planning & Development (steve.pfeiffer@seattle.gov)

Revise as follows:

1007.8 (IFC [B] 1007.8) Two-way communication. A two-way communication system complying with Sections 1007.8.1 and 1007.8.2 shall be provided at the landing serving each elevator ~~landing~~ or bank of elevators on each *accessible* floor that is one or more stories above or below the *story* of *exit discharge.* ~~complying with Sections 1007.8.1 and 1007.8.2.~~

Exceptions:

1. Two-way communication systems are not required at the landing serving each elevator ~~landing~~ or bank of elevators where the two-way communication system is provided within *areas of refuge* in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with *exit ramps* conforming to the provisions of Section 1010.

Reason: The purpose of this change is to clarify which elevator landings are required to have a two-way communication system where there are multiple elevators or banks of elevators on an accessible floor. The current language is clear where there is only one elevator, but if there are multiple elevators, it's unclear whether communication is required at one elevator, each elevator, or whether a communication device serving a bank of elevators would suffice. This change would require a single two-way communication at the landing for each single elevator or each bank of elevators on the floor. References to Sections 1007.8.1 and 1007.8.2 are also relocated as to more clearly apply to the communication system rather than the story of exit discharge.

Cost Impact: The code change proposal will not increase the cost of construction.

E48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.8-E-Pfeiffer.doc

E49 – 12
1007.8 (IFC [B] 1007.8)

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

1007.8 (IFC [B] 1007.8) Two-way communication. <u>Where elevators serve as part of an accessible means of egress,</u> a two-way communication system shall be provided at the elevator landing on each *accessible* floor that is one or more stories above or below the *story* of *exit discharge* complying with Sections 1007.8.1 and 1007.8.2.

Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with ramps conforming to the provisions of Section 1010.

Reason: The purpose of this proposal is to clarify that a communication system is only required if the landing serves elevators that are part of an accessible means of egress system. The current language could be interpreted as requiring it at every elevator landing on an accessible floor. However, the charging language in Section 1007.1 states that "Accessible means of egress shall comply with this section" meaning that 1007.8 would only apply to elevators that are part of an accessible means of egress.

Cost Impact: The code change proposal will not increase the cost of construction.

E49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.8-E-Traxler.doc

E50 – 12
1008.1.1 (IFC [B] 1008.1.1)

Proponent: Eirene Oliphant, MCP, BRR Architecture, representing self (eirene.oliphant@brrarch.com)

Revise as follows:

1008.1.1 (IFC [B] 1008.1.1) Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in a Group I-2 occupancy used for the movement of beds shall provide a clear width not less than 411/2 inches (1054 mm). The height of door openings shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in Group R-2 and R-3 occupancies.
2. Door openings to resident sleeping units in Group I-3 occupancies shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m2) in area shall not be limited by the minimum width.
4. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
5. Door openings within a dwelling unit or sleeping unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units and sleeping units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. In other than Group R-1 occupancies, the minimum widths shall not apply to interior egress doors within a dwelling unit or sleeping unit that is not required to be an Accessible unit, Type A unit or Type B unit.
8. Door openings required to be accessible within Type B units shall have a minimum clear width of 31.75 inches (806 mm).
9. <u>Doors serving walk-in coolers and freezers shall be permitted a maximum width for a swinging door leaf of 60 inches (1524 mm) nominal.</u>

Reason: Due to the square footages of some freezers and coolers, the use of pivoted or side-hinged swinging type door is required for meeting egress requirements. In an effort to give designers more options for utilizing doors more efficiently, a five foot wide door would allow for the use of a forklift.

Cost Impact: The code change proposal will not increase the cost of construction.

E50-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.1-E-OLIPHANT

E51 – 12
1008.1.1 (IFC [B] 1008.1.1)

Proponent: David R. Scott, AIA, representing Target Corporation (David.Scott@Target.com)

Revise as follows:

1008.1.1 (IFC [B] 1008.1.1) Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in a Group I-2 occupancy used for the movement of beds shall provide a clear width not less than 411/2 inches (1054 mm). The height of door openings shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in Group R-2 and R-3 occupancies.
2. Door openings to resident sleeping units in Group I-3 occupancies shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m2) in area shall not be limited by the minimum width.
4. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
5. Door openings within a dwelling unit or sleeping unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units and sleeping units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. In other than Group R-1 occupancies, the minimum widths shall not apply to interior egress doors within a dwelling unit or sleeping unit that is not required to be an Accessible unit, Type A unit or Type B unit.
8. Door openings required to be accessible within Type B units shall have a minimum clear width of 31.75 inches (806 mm).
9. <u>Doors to walk-in freezers and coolers less than 1000 square feet (93 m^2) in area shall have a maximum width of 60 inches (1524 mm).</u>

Reason: Freezers and coolers are used by employees that are familiar with their operation. Such doors would still need to meet the door opening force of section 1008.1.3. Section 1008.1.2, exception 1 indicates that private garages, office areas, factory and storage areas with an occupant load of 10 or less do not need to be pivoting or side hinged swinging type doors. Therefore, in such areas, an overhead type sectional door could be used as the egress door. I would expect a 60" swinging type freezer door to open easier than a sectional overhead type door.

Also note that Section 1103.2.15 indicates that walk-in coolers and freezers intended for employee use only are not required to be accessible. The code commentary indicates they may have raised floors, special door seals, and unconventional door-operating hardware.

Cost Impact: The code change proposal will not increase the cost of construction.

E51-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.1-E-Scott.doc

E52-12
1008.1.1 (IFC [B] 1008.1.1)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.1 (IFC [B] 1008.1.1) Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of 32 inches (813 mm). …

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in Group R-2 and R-3 occupancies.
2. Door openings to resident sleeping units in Group I-3 occupancies shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet ($0.93m^2$) in area shall not be limited by the minimum width.
4. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
5. Door openings within a dwelling unit or sleeping unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units and sleeping units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. In other than Group R-1 occupancies, the minimum widths shall not apply to interior egress doors within a dwelling unit or sleeping unit that is not required to be an Accessible unit, Type A unit or Type B unit.
8. Door openings required to be accessible within Type B units shall have a minimum clear width of 31 ¾ inches (806 mm).
9. <u>In Group R-1 dwelling units or sleeping units not required to be Accessible units, the minimum width shall not apply to doors for showers or saunas.</u>

Reason: IBC/IPC does not specify a width for sauna or shower doors at this time. Since these doors are literally means of egress, the door would have to meet a 32" clear width. The exception is consistent with ADA 224.1.2.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E52-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.1 - E-BALDASSARRA-CTC.docx

E53 – 12
1008.1.1 (IBC [F] 1008.1.1)

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1008.1.1 (IFC [B] 1008.1.1) Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in a Group I-2 occupancy used for the movement of beds shall provide a clear width not less than 41 ½ inches (1054 mm). The height of doors shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in Group R-2 and R-3 occupancies.
2. Door openings to resident sleeping units in Group I-3 occupancies shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet ($0.93m^2$) in area shall not be limited by the minimum width.
4. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
5. Door openings within a dwelling unit or sleeping unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units and sleeping units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. In other than Group R-1 occupancies, the minimum widths shall not apply to interior egress doors within a dwelling unit or sleeping unit that is not required to be an Accessible unit, Type A unit or Type B unit.
8. Door openings required to be accessible within Type B units shall have a minimum clear width of 31 ¾ inches (806 mm).
9. <u>The minimum door width shall not apply to a non-accessible toilet stall, shower stall, or other similar compartment,</u>

Reason: The proposed exception recognizes that most non-accessible toilet stalls, shower stalls, etc. are not 32 inches wide.

Cost Impact: The code change proposal will not increase the cost of construction.

E53-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.1-E-Dahmen.doc

E54 – 12
202, 1008.1.2, 1008.1.4.3 (IFC [B] 1008.1.2, 1008.1.4.3)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Add the definition as follows:

SECTION 202
DEFINITIONS

<u>**HORIZONTAL SLIDING ACCORDION FOLDING DOOR.** An accordion-folding style multiple-section track-hung moveable door assembly.</u>

Revise as follows:

1008.1.2 (IFC [B] 1008.1.2) Door swing. Egress doors shall be of the pivoted or side-hinged swinging type.

Exceptions:

1. Private garages, office areas, factory and storage areas with an *occupant load* of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single *dwelling unit* in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.
6. In other than Group H occupancies, *horizontal sliding <u>accordion folding</u> doors* complying with Section 1008.1.4.3 are permitted in a *means of egress*.
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual *sleeping unit* in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a *means of egress* from spaces with an *occupant load* of 10 or less.

Doors shall swing in the direction of egress travel where serving a room or area containing an *occupant load* of 50 or more persons or a Group H occupancy.

1008.1.4.3 (IFC [B] 1008.1.4.3) Horizontal sliding <u>accordion folding</u> doors. In other than Group H occupancies, *horizontal sliding <u>accordion folding</u>* doors permitted to be a component of a *means of egress* in accordance with Exception 6 to Section 1008.1.2 shall comply with all of the following criteria:

1. The doors shall be power operated and shall be capable of being operated manually in the event of power failure.
2. The doors shall be openable by a simple method from both sides without special knowledge or effort.
3. The force required to operate the door shall not exceed 30 pounds (133 N) to set the door in motion and 15 pounds (67 N) to close the door or open it to the minimum required width.
4. The door shall be openable with a force not to exceed 15 pounds (67 N) when a force of 250 pounds (1100 N) is applied perpendicular to the door adjacent to the operating device.
5. The door assembly shall comply with the applicable *fire protection rating* and, where rated, shall be self-closing or automatic closing by smoke detection in accordance with Section 716.5.9.3, shall be installed in accordance with NFPA 80 and shall comply with Section 716.
6. The door assembly shall have an integrated standby power supply.
7. The door assembly power supply shall be electrically supervised.
8. The door shall open to the minimum required width within 10 seconds after activation of the operating device.

Reason: This proposal is intended to clarify the IBC.

Our BHMA members are seeing code officials, specifiers, and other stakeholders questioning or attempting to apply the requirements of 1008.1.4.3 to the doors included in 1008.1.4.2. Currently, both IBC Sections 1008.1.4.2 and 1008.1.4.3 could be (incorrectly) interpreted as applying to the same types of sliding doors (power-operated horizontal sliding doors). However, the intent of the code is that these sections apply to doors of significantly different configurations.

The doors of 1008.1.4.2 are the more common power-operated doors such as the doors installed at the entrances to stores, businesses, hospitals, and the like. When a pedestrian is not present, these doors usually are in a closed position, and are powered open for passage, and then powered closed. The power operated doors included within the scope of the standards referenced in 1008.1.4.2 are rarely used where a fire-rated opening protective is required.

The doors in 1008.1.4.3 are an accordion-style folding door assembly which slides horizontally. In the opening, these doors are usually kept in an open position like many other fire-rated doors or smoke-rated doors protecting elevator lobbies, or other gathering areas. The doors in 1008.1.4.3 may travel on a track in a straight line, but may also travel on a track that has a curve or curves.

The proposed definition and text revisions are intended to not revise the technical requirements of the IBC.

Cost Impact: None

E54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.2-E-Woestman.doc

E55 – 12
1008.1.2, 1008.1.4.5(New); [IFC [B] 202, 1008.1.2, 1008.1.4.5(New)]

Proponent: David Dodge, McKeon Door Company, representing self (ddodge@mckeondoor.com)

Revise as follows:

1008.1.2 (IFC [B] 1008.1.2) Door swing. Egress doors shall be of the pivoted or side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.
10. In other than Group H occupancies, flexible fabric swing doors complying with Section 1008.1.4.5 are permitted in a means of egress from spaces with an occupant load of less than 50.

Doors shall swing in the direction of egress travel where serving a room or area containing an occupant load of 50 or more persons or a Group H occupancy.

1008.1.4.5 (IFC [B] 1008.1.4.5) Flexible Fabric Swing Doors. In other than Group H occupancies, flexible fabric swing doors serving as a component of a means of egress in accordance with Exception 10 of Section 1008.1.2 shall comply with the following criteria:

1. Where this door assembly is part of a fire-resistance-rated wall, the door assembly shall comply with the opening protective requirements in Section 716.
2. The door shall swing by means of continuous flexible fabric extending full height from the top of the door leaf to the bottom and shall incorporate a full width pivoting bottom bar.
3. The door shall be self-closing. When in the fully closed position the door shall be held in the closed position with the use of a full height self-attaching fastener.
4. The door shall be manually operable by one operation from both sides without special knowledge or effort.
5. The door shall be set in motion when subjected to a maximum force of 30-pound (133-N) and shall swing to a full open position when subjected to a maximum force or 15-pound (67 N).
6. Location of applied forces shall be to the direction of the swing from the egress side and to the pull handle from the opposite side.

Reason: Fire and smoke rated fabric that has been tested and labeled under UL standards can be installed in various opening protective applications where egress is required. However, the code does not currently include provisions for swing doors that are constructed of materials other than hard surface type when pushed open or held in the closed position. Technology is now available in the market place to incorporate flexible fabric door panels that are collapsible in the rolled-up position and egress compliant in the deployed position. This code change is to introduce, as an acceptable component of the means of egress system, a soft-surface style swing door that meets the basic fundamental requirements currently in the code for conventional hard surface style swing doors. To view this new technology functioning in a means of egress please go to www.youtube.com and search McKeon Door Company and watch the egress video titled FireFighter D200E.

Cost Impact: None

E55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.2-E-Dodge.doc

E56 – 12

202, 1008.1.4.1, Table 1008.1.4.1, 1008.1.4.1.1, 1008.1.4.1.2, Chapter 35 (IFC [B] 202, 1008.1.4.1, Table 1008.1.4.1, 1008.1.4.1.1, 1008.1.4.1.2, Chapter 80)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Add the definition as follows:

SECTION 202
DEFINITIONS

BREAKOUT. For revolving doors, a process whereby wings or door panels can be pushed open manually for *means of egress* travel.

Revise as follows:

1008.1.4.1 (IFC [B] 1008.1.4.1) Revolving doors. Revolving doors shall comply with the following:

1. Revolving doors shall comply with BHMA A156.27 and shall be installed in accordance with the manufacturer's installation instructions.
2. ~~Each revolving door shall be capable of collapsing into a bookfold position with parallel egress paths providing an aggregate width of 36 inches (914 mm).~~ Each revolving door shall be capable of *breakout* in accordance with BHMA A156.27 and shall provide an aggregate width of not less than 36 inches (914 mm).
3. ~~2.~~3. A revolving door shall not be located within 10 feet (3048 mm) of the foot of or top of *stairs* or escalators. A dispersal area shall be provided between the *stairs* or escalators and the revolving doors.
4. ~~3.~~4. The revolutions per minute (rpm) for a revolving door shall not exceed ~~those shown in Table 1008.1.4.1.~~the maximum rpm as specified in BHMA A156.27.
5. An emergency stop switch shall be provided near each entry point of a revolving door within 48 inches (1220 mm) of the door and between 24 inches (610 mm) and 48 inches (1220 mm) above the floor. The activation area of the emergency stop switch button shall be not less than 1 inch (25 mm) in diameter and shall be red.
6. ~~4.~~6. Each revolving door shall have a side-hinged swinging door which complies with Section 1008.1 in the same wall and within 10 feet (3048 mm) of the revolving door.
7. ~~5.~~7. Revolving doors shall not be part of an *accessible route* required by Section 1007 and Chapter 11.

~~TABLE 1008.1.4.1 (IFC [B] TABLE 1008.1.4.1)~~
~~REVOLVING DOOR SPEEDS~~

~~INSIDE DIAMETER (feet-inches)~~	~~POWER-DRIVEN-TYPE SPEED CONTROL (rpm)~~	~~MANUAL-TYPE SPEED CONTROL (rpm)~~
~~6-6~~	~~11~~	~~12~~
~~7-0~~	~~10~~	~~11~~
~~7-6~~	~~9~~	~~11~~
~~8-0~~	~~9~~	~~10~~
~~8-6~~	~~8~~	~~9~~
~~9-0~~	~~8~~	~~9~~
~~9-6~~	~~7~~	~~8~~
~~10-0~~	~~7~~	~~8~~

~~For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.~~

1008.1.4.1.1 (IFC [B] 1008.1.4.1.1) Egress component. A revolving door used as a component of a *means of egress* shall comply with Section 1008.1.4.1 and the following three conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the required egress capacity.
2. Each revolving door shall be credited with no more than a 50-person capacity.
3. Each revolving door shall ~~be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing~~ provide for egress in accordance with BHMA A156.27 with a *breakout* force of not more than 130 pounds.

1008.1.4.1.2 (IFC [B] 1008.1.4.1.2) Other than egress component. A revolving door used as other than a component of a *means of egress* shall comply with Section 1008.1.4.1. The ~~collapsing~~ *breakout* force of a revolving door not used as a component of a *means of egress* shall not be more than 180 pounds (801 N).

Exception: A ~~collapsing~~ *breakout* force in excess of 180 pounds (801 N) is permitted if the collapsing force is reduced to not more than 130 pounds (578 N) when at least one of the following conditions is satisfied:

1. There is a power failure or power is removed to the device holding the door wings in position.
2. There is an actuation of the *automatic sprinkler system* where such system is provided.
3. There is an actuation of a smoke detection system which is installed in accordance with Section 907 to provide coverage in areas within the building which are within 75 feet (22 860 mm) of the revolving doors.
4. There is an actuation of a manual control switch, in an *approved* location and clearly defined, which reduces the ~~holding~~ *breakout* force to ~~below the~~ not more than 130-pounds (578 N) ~~force level~~.

Add standard to Chapter 35 (IFC Chapter 80) as follows:

BHMA

A 156.27-11 Power and Manual Operated Revolving Pedestrian Doors

Reason: This proposal updates the requirements currently in the IBC for revolving doors and introduces the 2011 edition of BHMA A156.27 American National Standard for Power and Manual Operated Revolving Pedestrian Doors into the IBC.

Revolving doors currently being installed in commercial buildings range from 6 feet to 24 feet in diameter and include manually operated revolving doors and numerous types and sizes of automatic revolving doors (i.e. power operated revolving doors).

The latest edition of BHMA A156.27 includes in its scope a wide variety of manual and power operated revolving doors, many of which are not included within the scope of the current IBC requirements. The requirements in A156.27 include the maximum allowable door speed (RPM), based on type and size of revolving door, and ranges from maximum 12 RPM for the smallest manual revolving door to maximum 0.3 RPM for the largest power operated revolving door.

BHMA A156.27 includes requirements for egress including minimum egress width and maximum breakout force, and also includes requirements for signage, glazing, sensors, an emergency stop switch, and other criteria.

The existing Table 1008.1.4.1 is recommended to be deleted as there are five (5) expanded and updated tables in A156.27 addressing maximum allowable door speeds (RPM) for manually operated revolving doors and the various types and sizes of power operated revolving doors.

Cost Impact: Proposal updates IBC to current industry standards and practices resulting in no cost impact.

Analysis: A review of the standard proposed for inclusion in the code, BHMA A156.27-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

E_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.4.1-E-Woestman.doc

E57 – 12

202, 1008.1.4.2 (IFC [B] 202, 1008.1.4.2)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Add the following definition:

SECTION 202
DEFINITIONS

LOW ENERGY POWER-OPERATED DOOR. Swinging door which open automatically upon an action by an pedestrian, such as pressing a push plate or waving a hand in front of a sensor. The door closes automatically, and operates with decreased forces and decreased speeds. See also POWER ASSISTED DOOR and POWER OPERATED DOOR.

POWER-OPERATED DOOR. Swinging, sliding, or folding door which open automatically when approached by a pedestrian or open automatically upon an action by an pedestrian. The door closes automatically, and include provisions such as presence sensors to prevent entrapment. See also LOW ENERGY POWER OPERATED DOOR and POWER ASSISTED DOOR.

POWER-ASSISTED DOOR. Swinging door which opens by reduced pushing or pulling force on the door operating hardware. The door closes automatically after the pushing or pulling force is released, and function with decreased forces. See also LOW ENERGY POWER OPERATED DOOR and POWER OPERATED DOOR.

Revise as follows:

1008.1.4.2 (IFC [B] 1008.1.4.2) Power-operated doors. Where *means of egress* doors are operated or assisted by power~~, such as doors with a photoelectric-actuated mechanism to open the door upon the approach of a person, or doors with power assisted manual operation,~~ the design shall be such that in the event of power failure, the door is capable of being opened manually to permit *means of egress* travel or closed where necessary to safeguard *means of egress*. The forces required to open these doors manually shall not exceed those specified in Section 1008.1.3, except that the force to set the door in motion shall not exceed 50 pounds (220 N). The door shall be capable of swinging open from any position to the full width of the opening in which such door is installed when a force is applied to the door on the side from which egress is made. ~~Full-p~~Power-operated swinging doors, power-operated sliding doors, and power-operated folding doors shall comply with BHMA A156.10. Power-assisted swinging doors and low energy power-operated swinging doors shall comply with BHMA A156.19.

Exceptions:

1. Occupancies in Group I-3.
2. Horizontal sliding doors complying with Section 1008.1.4.3.
3. For a biparting door in the emergency breakout mode, a door leaf located within a multiple-leaf opening shall be exempt from the minimum 32-inch (813 mm) single-leaf requirement of Section 1008.1.1, provided a minimum 32-inch (813 mm) clear opening is provided when the two biparting leaves meeting in the center are broken out.

Reason: This proposal is intended to clarify the IBC and while not revising the technical requirements of the code.
The proposed definitions and text revisions are intended to more closely align the IBC with the standards currently referenced in Section 1008.1.4.2.
The doors of Section 1008.1.4.2 are the various types of power-operated doors such as the doors installed at the entrances to buildings, and may be installed within these same buildings.

Cost Impact: None.

E_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.4.2-E-Woestman.doc

E58 – 12
1008.1.5 (IFC [B] 1008.1.5)

Proponent: Eirene Oliphant, MCP, BRR Architecture, representing self

Revise as follows:

1008.1.5 (IFC [B] 1008.1.5) Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope).

Exceptions:

1. Doors serving individual dwelling units in Groups R-2 and R-3 where the following apply:
   1.1 A door is permitted to open at the top step of an interior flight of stairs, provided the door does not swing over the top step.
   1.2 Screen doors and storm doors are permitted to swing over stairs or landings.
2. Exterior doors as provided for in Section 1003.5, Exception 1, and Section 1020.2, which are not on an accessible route.
3. In Group R-3 occupancies not required to be Accessible units, Type A units or Type B units, the landing at an exterior doorway shall not be more than 73/4 inches (197 mm) below the top of the threshold, provided the door, other than an exterior storm or screen door, does not swing over the landing.
4. Variations in elevation due to differences in finish materials, but not more than 1/2 inch (12.7mm).
5. Exterior decks, patios or balconies that are part of Type B dwelling units, have impervious surfaces and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the dwelling unit.
6. <u>Doors serving equipment spaces not required to be accessible in accordance with Section 1103.2.9 shall be permitted to have the landings on both sides to be at different levels provided the elevation difference is not more than 7 inches (178 mm).</u>

Reason: This is language that was in the 1997 UBC. When designing facilities which utilize electrical equipment rooms that are prefabricated, allowing a change in elevation to exist at the doors serving these rooms gives the designer more flexibility. To meet the current code language would require the use of ramps for changes in elevations of approximately 7 inches. When a single step with a maximum riser of 7 inches is permitted for buildings with Groups F, H, R-2, r-3, S and U that are not required to be accessible, why cannot a single step serving a room that is not normally occupied be allowed to be used as well.

Cost Impact: The code change proposal will not increase the cost of construction.

E58-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.5-E-OLIPHANT

E59 – 12
1008.1.5 (IFC [B] 1008.1.5)

Proponent: David R. Scott, AIA, representing Target Corporation (David.Scott@Target.com)

Revise as follows:

1008.1.5 (IFC [B] 1008.1.5) Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope).

Exceptions:

1. Doors serving individual dwelling units in Groups R-2 and R-3 where the following apply:
   1.1 A door is permitted to open at the top step of an interior flight of stairs, provided the door does not swing over the top step.
   1.2 Screen doors and storm doors are permitted to swing over stairs or landings.
2. Exterior doors as provided for in Section 1003.5, Exception 1, and Section 1020.2, which are not on an accessible route.
3. In Group R-3 occupancies not required to be Accessible units, Type A units or Type B units, the landing at an exterior doorway shall not be more than 7 3/4 inches (197 mm) below the top of the threshold, provided the door, other than an exterior storm or screen door, does not swing over the landing.
4. Variations in elevation due to differences in finish materials, but not more than 1/2 inch (12.7 mm).
5. Exterior decks, patios or balconies that are part of Type B dwelling units, have impervious surfaces and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the dwelling unit.
6. <u>Doors serving equipment spaces not required to be accessible in accordance with Section 1103.2.9 and serving an occupant load of 5 or less shall be permitted to have the landings on both sides to be at different levels provided the elevation difference is not more than 7 inches (178 mm).</u>

Reason: Equipment spaces are utilized by personal familiar with the layout and function of such space. This would not constitute a hazard type situation stepping down from the equipment spaces.

Cost Impact: The code change proposal will not increase the cost of construction.

E59-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.5-E-Scott.doc

E60 – 12
1008.1.7 (IFC [B] 1008.1.7)

Proponent: Julie Ruth, P.E., JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA) (julruth@aol.com)

Revise as follows:

1008.1.7 (IFC [B] 1008.1.7) Thresholds. Thresholds at doorways shall not exceed ¾ inch in height above the finished floor or landing for sliding doors serving dwelling units or ½ inch above the finished floor or landing for other doors. Raised thresholds and floor level changes greater than ¼ inch at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).

~~Exception~~ Exceptions:

1. In occupancy Group R-2 or R-3, threshold heights for sliding and side-hinged exterior doors shall be permitted to be up to 7 ¾ inches in height if all of the following apply:
   1.1. The door is not part of the required means of egress.
   1.2. The door is not part of an accessible route as required by Chapter 11.
   1.3. The door is not part of an *Accessible unit, Type A unit* or *Type B unit*.
2. In Type B units, where Exception 5 to Section 1008.1.5 permits a 4-inch (102 mm) elevation change at the door, the threshold height on the exterior side of the door shall not exceed 4 ¾ (120 mm) inches in height above the exterior deck, patio or balcony for sliding doors or 4 1/2 inch (114 mm) above the exterior deck, patio or balcony for other doors.

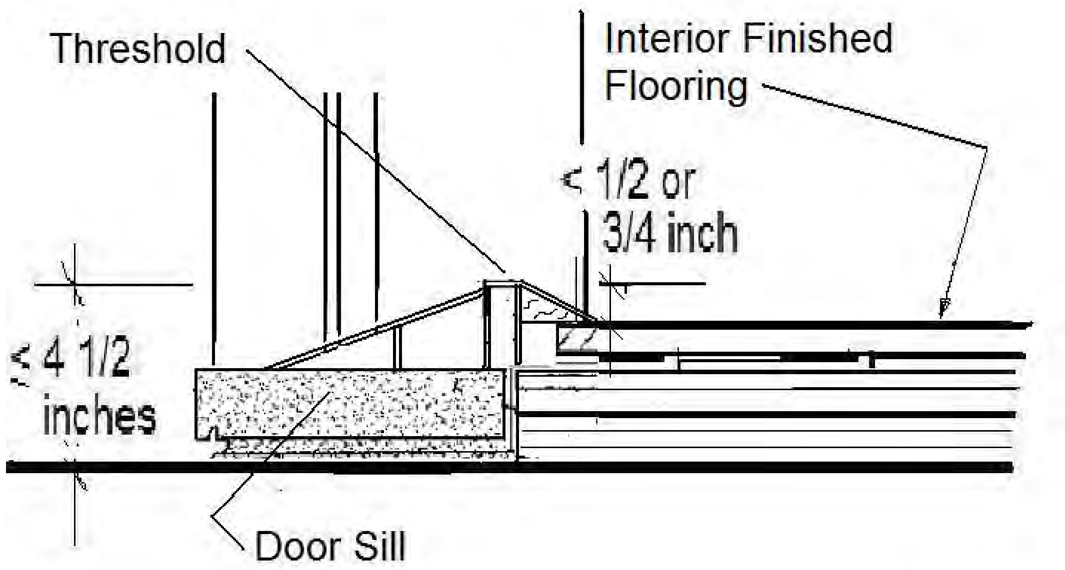
Reason: Currently an exception to the threshold height provisions of Section 1008.1.7 exists for doors where a 7 ¾ inch step down is permitted by exception 3 to Section 1008.1.5. Specifically this is limited to exterior doors that are not part of the required means of egress, and which are not serving *Accessible units*, *Type A units* or *Type B units*.

This proposal adds a second exception for doors where a 4 inch step down is permitted between Type B dwelling units and exterior decks, patios and balconies by exception 5 to Section 1008.1.5. This proposal would permit the height of the threshold itself to exceed ½ or ¾ inch in height, as long as the resultant profile from the interior floor to the exterior surface is maintained as required by current code text.

The sketch below provides an example of the type of installation that would be permitted by this proposal. Specifically, the threshold itself is higher than ½ or ¾ inch. The additional height, however, is contained within the 4 inch step down that is permitted between the interior floor and the exterior surface for doors serving *Type B* dwelling units. The height of the threshold is limited to ½ inch or ¾ inch above the interior floor and shall not be more than 4 ½ or 4 ¾ inch above the exterior surface, depending upon the type of door. If the threshold is greater than ¼ inch above the interior floor it is to be beveled at a slope of 1 inch vertical to 2 inches horizontal (50% slope), as required by current text.

The higher threshold is needed to prevent water infiltration underneath the door into the dwelling unit. A threshold height of ¾ inch is only sufficient to resist water infiltration in areas of low wind and exceptionally low rainfall. Throughout most of the rest of the U.S. the potential for water to leak into interior spaces under conditions of high wind combined with heavy rain does exist with a door threshold of only ¾ inch in height. Along the gulf coast and eastern seaboard much higher thresholds of up to 2 ½ inches in height are needed to sufficiently resist water infiltration under extreme weather conditions.

These sills can be accommodated within the 4 inch step down permitted between *Type B* dwelling units and exterior decks, patios and balconies. Permitting this higher threshold facilitates compliance with Chapter 11. For example, Section 1107.6.2.1.2 requires every apartment in R-2 occupancies with more than 4 dwelling units to be *Type B* units. If a higher threshold is not permitted between exterior decks, balconies and patios that serve these units and the actual units themselves, throughout most of the country exterior decks, balconies and patios could not be installed in R-2 occupancies without creating a potential risk of serious water damage to the interior of the building under extreme weather conditions.



Cost Impact: None

E60-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E1008.1.7-E-Ruth.doc

E61 – 12
1008.1.8 (IBC [F] 1008.1.8)

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1008.1.8 (IFC [B] 1008.1.8) Door arrangement. Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

Exceptions:

1. The minimum distance between horizontal sliding power-operated doors in a series shall be 48 inches (1219 mm).
2. Storm and screen doors serving individual dwelling units in Groups R-2 and R-3 need not be spaced 48 inches (1219 mm) from the other door.
3. Doors within individual dwelling units in Groups R-2 and R-3 other than within Type A dwelling units.
4. Where doors in a series are elements of an accessible route, the space between the two doors shall be permitted to be spaced such that in the space between the doors a wheelchair space is provided beyond the swing of the door.

Reason: The proposed exception provides recognition that not all doors are in alignment. In those situations where the two doors may be in series, but not necessarily aligned with a straight line path of egress, this exception would provide an acceptable approach.

Cost Impact: The code change proposal will not increase the cost of construction.

E61-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.8-E-Dahmen.doc

E62 – 12
1008.1.3, 1008.1.9.1 (IFC [B] 1008.1.3, 1008.1.9.1)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.3 (IFC [B] 1008.1.3) Door opening force. The force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed 5 pounds (22 N). <u>These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.</u> For other swinging doors, as well as sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full open position when subjected to a 15-pound (67 N) force.

1008.1.9.1 (IFC [B] 1008.1.9.1) Hardware. Door handles, pulls, latches, locks and other operating devices on doors required to be *accessible* by Chapter 11 shall not require tight grasping, tight pinching or twisting of the wrist to operate <u>and shall not require more than a 15-pound (67 N) force to unlatch</u>.

Reason: The proposed language in Section 1008.1.3 is intended to clarify the IBC, and to be consistent with A117.1.

The sentence proposed for 1008.1.9.1 quantifies the maximum force allowable to operate door hardware to unlatch a door which is required to be accessible. Currently, the IBC is silent regarding this requirement. This maximum force is consistent with the maximum force allowed for panic hardware and fire exit hardware (IBC Section 1008.1.10.1) commonly installed on doors required to be accessible in the means of egress.

Cost Impact: None.

E62-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.1-E-Woestman.doc

E63 – 12
1008.1.9.3 (IFC [B] 1008.1.9.3)

Proponent: Lee J. Kranz, City of Bellevue, Washington, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

Revise as follows:

1008.1.9.3 (IFC [B] 1008.1.9.3) Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main ~~exterior~~ door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   2.1. The locking device is readily distinguishable as locked;
   2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN ~~BUILDING~~ <u>THIS TENANT SPACE</u> IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
   2.3. The use of the key-operated locking device is revokable by the *building official* for due cause.
3. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

Reasoning: The proposed change is consistent with an interpretation given by ICC staff that this condition is allowed to exist. The issue that this addresses is one where you have a restaurant door opening into a mall; the door to the mall could be the "main" exit but not be an "exterior" door.

Cost Impact: The code change proposal will not increase the cost of construction.

E63-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.3 #1-E-KRANZ

E64 – 12
1008.1.9.3 (IFC [B] 1008.1.9.3)

Proponent: Jeff Sprout, AIA, Target, representing Target Corporation (jeff.sprout@target.com)

Revise as follows:

1008.1.9.3 (IFC [B] 1008.1.9.3) Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main ~~exterior~~ door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   - 2.1. The locking device is readily distinguishable as locked;
   - 2.2 A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and

     <u>Exception: Buildings shall not be considered “occupied” after business hours in multiple-exit buildings where employees, security and cleaning crews have access to other exits without requiring the use of a key or in small buildings with one exit.</u>

   - 2.3. The use of the key-operated locking device is revokable by the *building official* for due cause.
3. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

Reason: Provide clarification to the intent of the required signage in that it does not pertain to “after business hours” when employees, security and cleaning crews have access to other exits without requiring the use of a key or to small building that require only one exit. The above statement is supported by the code commentary as provided for Exception 2.

Cost Impact: The code change proposal will not increase the cost of construction.

E64-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.3-E-SPROUT

E65 – 12
1008.1.9.3 (IFC [B] 1008.1.9.3)

Proponent: Lee J. Kranz, City of Bellevue, Washington, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

Revise as follows:

1008.1.9.3 (IFC [B] 1008.1.9.3) Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

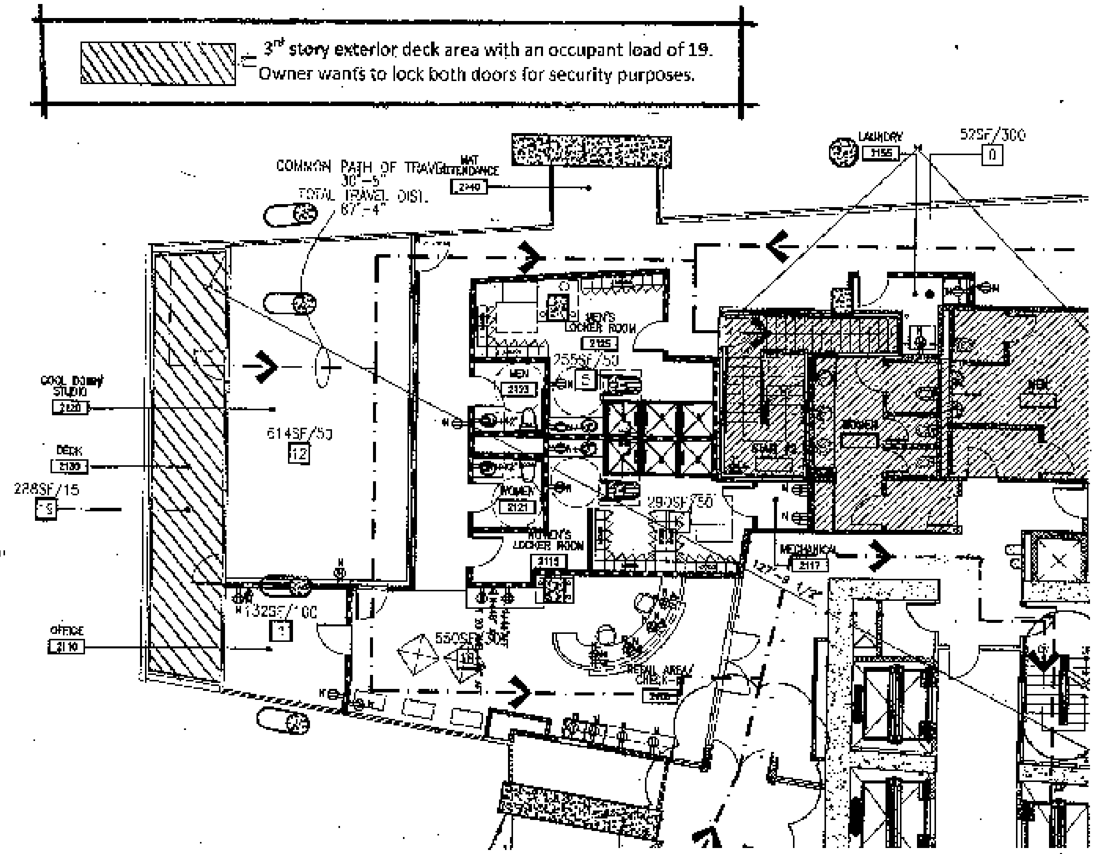
1. Places of detention or restraint.
2. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   - 2.1. The locking device is readily distinguishable as locked;
   - 2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
   - 2.3. The use of the key-operated locking device is revokable by the *building official* for due cause.
3. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual *dwelling* or *sleeping units* of Group R occupancies having an *occupant load* of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.
6. <u>Where occupants must re-enter the building for egress purposes, doors serving outdoor areas of Group R-3 occupancies and individual sleeping units or dwelling units of Group R-2 occupancies with an occupant load of 10 or less are permitted to be equipped with locks or latches provided such devices are openable from the inside without the use of a key or special knowledge or effort.</u>
7. <u>Egress doors serving outdoor areas having an occupant load of 300 or less where single or multiple paths of egress travel from the outdoor area are required to pass through the building are permitted to be equipped with locks or latches provided</u>
   - <u>7.1 The locking device is readily distinguishable as locked on the interior side.</u>
   - <u>7.2 A readily visible durable sign is posted on the interior side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED. The sign shall be in letters 1 inch high on a contrasting background</u>
   - <u>7.3 The use of the key-operated locking device is revocable by the building official for due cause.</u>

Reasoning:

Item #6: Currently there are no provision in the code that allow locks or latches to be installed on doors serving outdoor areas of R-3 or R-2 sleeping units or dwelling units where the occupants must re-enter the building for egress purposes. Exception #2 of IBC Section 1004.5 is unclear in this regard. It is common practice to install locks or latches on exterior doors serving these outdoor areas to maintain security. Occupant loads exceeding 10 persons would not be allowed to use the provision, similar to item #4 of this section.

Item #7: Currently egress doors serving outdoor areas, where single or multiple paths of egress travel are required to pass through the building, are not permitted to have locks or latches. For security purposes, building owners or tenants typically install locks on required egress doors from these areas. When occupants must re-enter the building, as is typical for elevated decks where an exterior stair from the deck is impractical, IBC Section 1004.5 requires an unobstructed path of egress from these outdoor areas, similar to any occupied room in the building.

The sketch below illustrates this situation. The deck shown is on the 4th floor of the building. The installation of an exterior stairway is not practical. The owner wants to lock the doors for security purposes but this is a problem because, per IBC Section 1004.5, occupants must be able to egress from the deck at any time.



Cost Impact: The code change proposal will increase the cost of construction. This is due to the cost of installing a sign above the door and a locking device which is distinguishable as "locked".

E65-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.3 #2-E-KRANZ

E66-12
1008.1.9.6 (IFC [B] 1008.1.9.6)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.6 (IFC [B] 1008.1.9.6) Special locking arrangements in doors in ~~Group~~ Groups I-1 assisted living facilities and I-2. Approved, special egress locks shall be permitted in a Group I-1 assisted living facilities or I-2 ~~occupancy~~ occupancies where the clinical needs of persons receiving care require such locking. Special egress locks shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic~~-~~smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with Items 1 through 7 below.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.
4. A building occupant shall not be required to pass through more than one door equipped with a special egress lock before entering an exit.
5. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.
7. Emergency lighting shall be provided at the door.

    Exception: Items 1 through 4 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a psychiatric treatment area.

Reason: The current text allows special provisions in the path of egress for Group I-2 when patient care, most often due to issues of elopement, allows for staff to control access to the exits. This allowance should be permitted in assisted living facilities in order to allow proper care for residents in the initial stages of Alzheimer's, therefore, this allowance needs to be extended to Group I-1 assisted living facilities.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: Increase

E66-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.6-E-BALDASSARRA-CTC.docx

E67-12
1008.1.9.6 (IFC [B] 1008.1.9.6)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.6 (IFC [B] 1008.1.9.6) ~~Special~~ Controlled egress ~~locking arrangements in~~ doors in Group I-2. ~~Approved,~~ Electric ~~special egress~~ locks, including electro-mechanical locks and electromagnetic locks, shall be permitted to be locked in the means of egress in a Group I-2 occupancy where the clinical needs of persons receiving care require their containment. ~~such locking.~~ ~~Special egress~~ ~~locks~~ Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with Items 1 through ~~7~~ 8 below.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a switch that directly breaks power to the lock, located ~~signal from~~ at the fire command center, a nursing station or other approved location.
4. A building occupant shall not be required to pass through more than one door equipped with a ~~special~~ controlled egress lock before entering an exit.
5. The procedures for the ~~operation(s) of the~~ unlocking ~~system~~ of the doors shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.
7. Emergency lighting shall be provided at the door.
8. All components of the door locking system shall be listed in accordance with UL 294.

Exception: Items 1 through 4 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a psychiatric treatment area.

Reason: This section deals with the use of electric locks to enhance the capabilities of egress control. Egress control serves three primary purposes. These are to control the elopement of ambulatory patients not capable of self preservation; the containment of patients that, due to their mental condition, could do harm to others; the prevention of the abduction of babies and children. Exceptions allow for the use of listed child abduction security systems and even mechanical locks (non-electric.)

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E67-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.6#2-E-WILLIAMS-ADHOC.doc

E68 – 12
1008.1.9.6 (IFC [B] 1008.1.9.6)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.9.6 (IFC [B] 1008.1.9.6) ~~Special locking arrangements~~ Controlled egress doors in Group I-2. ~~*Approved* special egress~~ Electric locks including electro-mechanical locks and electromagnetic locks shall be permitted to be locked in the means of egress in a Group I-2 occupancy where the clinical needs of persons receiving care require their containment. ~~such locking. Special egress locks~~ Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with Items 1 through ~~7~~8.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall be installed to have the capability of being unlocked by a ~~signal from~~ switch located at the *fire command center*, a nursing station or other *approved* location. The switch shall directly break power to the lock.
4. A building occupant shall not be required to pass through more than one door equipped with a ~~special~~ controlled egress lock before entering an *exit*.
5. The procedures for the ~~operation(s) of the~~ unlocking of the doors ~~system~~ shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4 of the *International Fire Code*.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.
7. Emergency lighting shall be provided at the door.
8. The components of the door locking system shall be listed in accordance with UL 294.

   Exception: Items 1 through 4 shall not apply to doors to areas where persons, which because of clinical needs, require restraint or containment as part of the function of a psychiatric treatment area.

Reason: Changes above illustrate BHMA's suggested revisions from the 2012 IBC incorporating the ICC AHC MOE work group's proposed revisions, and further BHMA revisions. Further revisions are recommended to Items 3 and 8. The further revisions are essentially editorial or help to clarify the intent.

Background: the Builders Hardware Manufacturers Association (BHMA) members have been observing the AHC and CTC meetings and activities with most interest in the potential code proposals that may have implications to the means of egress, and to doors and door hardware requirements.

The BHMA Codes and Government Affairs (CGA) committee met immediately after the Orlando ICC AHC meeting for a final look-see at the proposed AHC language. Many of the BHMA CGA members had reviewed the draft AHC MOE language individually without identifying concern or opportunities for improvement. But when together in Orlando, the BHMA members identified several opportunities for further revision to the AHC proposals.

We've captured our suggestions for additional considerations in this proposal. We're not wanting to circumvent the work of the AHC and CTC; that's why several of us have been attending the AHC and CTC meetings and phone calls. We just did not recognize some of the opportunities while reviewing the language individually, and only when the BHMA CGA committee got together for – what we thought would be – a quick final review, did we realize several concerns and opportunities for revisions.

Cost Impact: None.

E68-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.6-E-Woestman.doc

E69-12
1008.1.9.6 (IFC [B] 1008.1.9.6)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.6 (IFC [B] 1008.1.9.6) Special locking arrangements in Group I-2. Approved, special egress locks shall be permitted in a Group I-2 occupancy where the clinical needs of persons receiving care require such locking. Special egress locks shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with Items 1 through 7 below.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.
4. A building occupant shall not be required to pass through more than one door equipped with a special egress lock before entering an exit.
5. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.
7. Emergency lighting shall be provided at the door.

~~Exception~~ <u>Exceptions</u>:

<u>1.</u> Items 1 through 4 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a ~~psychiatric~~ treatment area.

<u>2. Items 1 through 4 shall not apply to doors to areas where a listed egress control system is utilized to reduce the risk of child abduction.</u>

Reason: This section deals with the use of electric locks to enhance the capabilities of egress control. Egress control serves three primary purposes. These are to control the elopement of ambulatory patients not capable of self preservation; the containment of patients that, due to their mental condition, could do harm to others; the prevention of the abduction of babies and children. Exceptions allow for the use of listed child abduction security systems and even mechanical locks (non-electric.)

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E69-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.6#1-E-WILLIAMS-ADHOC.doc

E70-12
1008.1.9.7 (IFC [B] 1008.1.9.7)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Delayed egress ~~locks~~. ~~*Approved, listed,*~~ Delayed egress ~~locks~~ locking systems, shall be permitted to be installed on doors serving any occupancy except Group A, E, and H occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907~~,~~. The locking system shall allow immediate free egress and shall be installed and operated ~~provided that the doors unlock~~ in accordance with Items 1 through ~~6~~ 7 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit.*

1. The delay electronics shall deactivate ~~doors unlock~~ upon actuation of the *automatic sprinkler system* or automatic fire detection system, allowing immediate, free egress.
2. The ~~doors unlock~~ delay electronics shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.
3. The ~~door locks~~ delay electronics shall have the capability of being ~~unlocked by a signal from~~ deactivated at the fire command center and other approved locations.
4. An attempt to egress ~~The initiation~~ ~~of~~ shall initiate an irreversible process which ~~will release the~~ shall allow such egress in not more than 15 seconds when a ~~force of not more than 15 pounds (67 N)~~ physical effort to exit is applied to the egress side door hardware for *not more than* ~~*1*~~ *3* ~~*second*~~ *seconds* ~~to the release device~~. The effort to open the door shall not require a force greater than 30 pounds (133N). Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay electronics ~~door lock~~ ~~has~~ have been ~~released~~ deactivated, ~~by the application of force to the releasing device~~, ~~relocking~~ rearming the delay electronics shall be by manual means only.

   Exception: Where approved, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. A sign shall be provided on the door located above and within 12 inches (305mm) of the ~~release device~~ door exit hardware reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS. The sign shall comply with the visual character requirements in ICC A117.1.
6. Emergency lighting shall be provided ~~at~~ on the egress side of the door.
7. All components of the door locking system shall be listed in accordance with UL 294.

Reason: The intent of this proposal is to clarify the delayed egress locking system requirements. The intent is for all proposals for Section 1008.1.9.7 to work together. Three changes are submitted in order to keep the discussions separate.

The term “delayed egress lock” is proposed to be changed to “delayed egress locking system.” Delayed egress always requires a system of electronic devices that work together to perform the delayed egress task. Sometimes they are contained within an electromagnetic lock or a bar and sometimes they are separate components, but they are never just a lock.

The term ‘unlock” is proposed to change to “allow immediate free egress.” Immediate free egress can be accomplished without unlocking the door. Merchants, offices and health care facilities are hesitant to use delayed egress because an “after hours” egress event will leave their building unlocked. Addressing the “delay” as a separate issue from “locked”, this modification will allow the door to relock FROM THE OUTSIDE after a delayed egress event, but change the operation of the door to free egress until the system is manually reset. The intent of the code is not to keep people out. Instead, it is to let them out.

In Item 4 it is proposed to change the delay from one second to three seconds. One second is not enough time for a fully cognizant person to recognize that their action is what is causing the alarm and decide to abort the exit attempt. Dementia patients tend to wander toward doors when not otherwise engaged. Since staffing cannot be 1:1, it means that the nurses are attending other issues. Reducing these “nuisance” alarm issues can greatly reduce the need to drop everything and go check and reset the door.

In Item 4 it is proposed to make the force requirement consistent with Section 1008.1.3. There are three ways to initiate a delay sequence that are in common use, today. The code has never been changed to accommodate two of these. The original one, an electromagnetic lock with delay electronics and a switch built into the case, is not addressed. It allows the use of existing door hardware and should be used with exit only applications. Otherwise, it can be triggered from both sides. The second means of delay initiation includes switches in cylindrical and mortise locks that begin the sequence when the inside lever is turned. This method has become possible with the ADA changes made to these locks to accommodate levers. The third method is the one the code seems to reference. It uses a switch bar (aka active dummy with switch), a panic bar with a switch, or fire-exit hardware with a switch. Depending on the manufacturer and the model number, the switch may either signal an external delay timer that controls an electromagnetic lock or signal a self-contained delayed egress system that controls a latch.

In Item 5 it is proposed to require a contrasting color for signage. Manufacturers typically supply the sign with their product, but often the sign blends in with the color of the door. The reference to ICC A117.1 visual requirements would not require engraved letters or Braille, but would require readable text, with good finish and contrast.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E70-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7#2-E-WILLIAMS-ADHOC.doc

E71 – 12
1008.1.9.7 (IFC [B] 1008.1.9.7)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Delayed egress locks. ~~*Approved, listed*,~~ Delayed egress ~~locks~~ locking systems, shall be permitted to be installed on doors serving any occupancy except Group A, E and H occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907~~,~~. The locking system shall be installed and operated ~~provided that the doors unlock~~ in accordance with Items 1 through ~~6~~7 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit*.

1. The delay electronics shall deactivate ~~doors unlock~~ upon actuation of the *automatic sprinkler system* or automatic fire detection system, allowing immediate, free egress.
2. The ~~doors unlock~~ delay electronics shall deactivate upon loss of power controlling the lock or lock mechanism, allowing immediate free egress.
3. The ~~door locks~~ delay electronics shall have the capability of being ~~unlocked by a signal from~~ deactivated at the fire command center and other approved locations.
4. ~~The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device.~~ A force of not more 15 pounds applied to the egress side release device for not more than 3 seconds shall initiate an irreversible process which shall allow egress in not more than 15 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. The door shall be set in motion when subjected to a force of not more than 30 pounds (133 N). The door shall be able to swing to a full open position when subjected to a force of not more than 15 pounds (67 N). ~~Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.~~ Once the delay electronics have been deactivated, rearming the delay electronics shall be by manual means only.

   Exception: Where *approved*, a delay of not more than 30 seconds is permitted.

5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.
6. Emergency lighting shall be provided at the door.
7. The components of the door locking system shall be listed in accordance with UL 294.

Reason: Changes above illustrate BHMA's suggested revisions from the 2012 IBC incorporating the ICC AHC MOE work group's proposed revisions, and further BHMA revisions. Additional revisions are suggested to the main paragraph, Item 4 and Item 7.

Item 4 will benefit from a clarification of where and how the maximum 15 pound force is applied to initiate the delay "count down". Also in Item 4, the maximum force allowed to set the door in motion, and to swing to the full open position, comes from Section 1008.1.3. The other revisions are essentially editorial or help to clarify the intent.

Background: the Builders Hardware Manufacturers Association (BHMA) members have been observing the AHC and CTC meetings and activities with most interest in the potential code proposals that may have implications to the means of egress, and to doors and door hardware requirements.

The BHMA Codes and Government Affairs (CGA) committee met immediately after the Orlando AHC meeting for a final look-see at the proposed AHC language. Many of the BHMA CGA members had reviewed the draft AHC MOE language individually without identifying concern or opportunities for improvement. But when together in Orlando, the BHMA members identified several opportunities for further revision to the AHC proposals.

We've captured our suggestions for additional considerations in this proposal. We're not wanting to circumvent the work of the AHC and CTC; that's why several of us have been attending the AHC and CTC meetings and phone calls. We just did not recognize some of the opportunities while reviewing the language individually, and only when the BHMA CGA committee got together for – what we thought would be – a quick final review, did we realize several concerns and opportunities for revisions.

Cost Impact: None.

E71-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7 #1-E-Woestman.doc

E72-12
1008.1.9.7 (IFC [B] 1008.1.9.7)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Delayed egress ~~locks~~. *Approved, listed*, delayed egress ~~locks~~ locking systems, shall be permitted to be installed on doors serving any occupancy except Group A, E, and H occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through ~~6~~ 7 below. ~~A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit*.~~

1. The doors unlock upon actuation of the *automatic sprinkler system* or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for *1 second* to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

   Exception: Where approved, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. The egress path from any point shall pass through no more than one delayed egress door.

   Exception: In Group I-2 or I-3 occupancies, the egress path from any point in the building shall be permitted to pass through no more than two delayed egress doors provided the combined delay does not exceed 30 seconds.

6. A sign shall be provided on the door located above and within 12 inches (305mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS.
7. Emergency lighting shall be provided at the door.

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent is for both proposals for Section 1008.1.9.7 to work together. Two changes are submitted in order to keep the discussions separate.

Since delayed egress was developed in two separate theaters for two separate reasons, pilfering was a reason that is perfect for *one* 15 second delay. Back then, sprinkler requirements were not like they are today. On the other hand, delayed egress for health care in a fully sprinklered facility should be recognized as being different. A delay of thirty seconds is appropriate for this situation and so should two 15 second delays when used for good purpose, as they delay the person for no more time and often for less time. Following are two good purposes:

1. Property, especially in cities, is at a premium in both price and availability. For this reason, we see more and more two and three story ambulatory health care facilities as a result of needing to build up instead of out. This comes with a need to keep Alzheimer's disease and Head Injury patients on the floor **and** in the building. Currently, the facility is tasked with having to make a dangerous and unnecessary choice.
2. Most large (60+) single story dementia facilities have a perimeter fence surrounding the back and sides of the building. All exits except the front door are into a protected yard. The front door controls entry into the office/lobby area and reception. It is a small area requiring only the front door as an exit. A second door leading from the front office area into the core of the facility keeps the residents from eloping and strangers from entering. Originally, this door was not an exit and the facility side of the door was disguised as a wall so residents (patients) would not try to get out. Since it was not an exit, a delayed egress system was placed on that door and another one on the front door. Keypads were on both sides and both systems would unlock upon activation of the fire alarm. It was a mantrap designed so that if the lobby to core door went into alarm, the front door would instantly become delayed egress. Pursuant to the "discovery" and subsequent enforcement of the idea that if people exit the way they entered, the lobby to core door was an exit, should not be disguised and the front door could no longer be delayed. Without exceptions for those with health issues, the patients were now less safe than before. Allowing two 15 second delays would return them to a safe environment. This reasoning could also be applied toward doors leading into a common lobby with a stair tower door. The stair tower door would be free egress unless someone had triggered the ward delay in an attempt to elope from the ward. This would set off the alarm and arm the stair tower door's delayed egress system.

Cost Impact: None

E72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7#3-E-WILLIAMS-ADHOC.doc

E73 – 12
1008.1.9.7 (IFC [B] 1008.1.9.7)

Proponent: Dave Frable, U.S General Services Administration, Public Buildings Service, representing U.S. General Services Administration, Public Buildings Service

Revise as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Delayed egress locks. *Approved, listed*, delayed egress locks shall be permitted to be installed on doors serving any occupancy except Group A, E and H occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit*.

1. The doors unlock upon actuation of the *automatic sprinkler system* or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

   Exception: Where *approved*, a delay of not more than 30 seconds is permitted.

5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device~~. reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30]SECONDS~~.
   - <u>5.1. For doors that swing in the direction of egress, the sign shall read: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.</u>
   - <u>5.2. For doors that swing in the opposite direction of egress, the sign shall read: PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS.</u>
6. Emergency lighting shall be provided at the door.

Reason: The intent of this code change proposal is to acknowledge an UL listed delayed egress hardware that can be used on doors that swing in the opposite direction of egress, whereby pulling on the hardware engages the 15 or 30 second timer. As such, the subject signage requirements need to be revised to accommodate where such hardware is to be installed. Note: although most delayed egress hardware is installed on doors that swing in the direction of egress, there is no language currently in this section that actually prohibits installing delayed egress hardware on doors that swing in the opposite direction, unless one uses existing language for the signage as a means for prohibiting its use.

Cost Impact: This code change will not increase the cost of construction.

E73-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7-E-Frable.doc

E74-12
1008.1.9.7 (IFC [B] 1008.1.9.7)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Delayed egress locks*. Approved, listed*, delayed egress ~~locks~~ <u>locking systems,</u> shall be permitted to be installed on doors serving any occupancy except Group A, E, and H occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit.*

1. The doors unlock upon actuation of the *automatic sprinkler system* or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for *1 second* to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released, by the application of force to the releasing device, relocking rearming shall be by manual means only.

   Exception: Where approved, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. A sign shall be provided on the door located above and within 12 inches (305mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS.

   <u>**Exception:** Where approved, the installation of a sign is not required when it interferes with the safety of the residents in Group I occupancies.</u>

6. Emergency lighting shall be provided at the door.

Reason: The intent is for all proposals for Section 1008.1.9.7 to work together. Three changes are submitted in order to keep the discussions separate.

The new exception to Item 5 - Providing escape instructions to first stage Alzheimer's disease patients who often still can read is unwise. Staff is there to assist in a fire.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E74-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7#1-E-WILLIAMS-ADHOC.doc

E75 – 12
1008.1.9.7 (IFC [B] 1008.1.9.7)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Delayed egress locks. *Approved, listed*, delayed egress ~~locks~~ locking systems, shall be permitted to be installed on doors serving any occupancy except Group A, E, and H occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit.*

1. The doors unlock upon actuation of the *automatic sprinkler system* or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for *1 second* to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released, by the application of force to the releasing device, relocking rearming shall be by manual means only.

   Exception: Where approved, a delay of not more than 30 seconds is permitted on a delayed egress door.

5. A sign shall be provided on the door located above and within 12 inches (305mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS.

   Exception: Where approved, the installation of a sign is not required when the instructions compromise the safety of the residents in Group I occupancies.

6. Emergency lighting shall be provided at the door.

Reason: Changes above illustrate BHMA's suggested revisions from the 2012 IBC incorporating the ICC AHC MOE work group's proposed revisions, and further BHMA revisions. The further proposed revisions are essentially editorial and help to clarify the intent.

Background: the Builders Hardware Manufacturers Association (BHMA) members have been observing the AHC and CTC meetings and activities with most interest in the potential code proposals that may have implications to the means of egress, and to doors and door hardware requirements.

The BHMA Codes and Government Affairs (CGA) committee met immediately after the Orlando AHC meeting for a final look-see at the proposed AHC language. Many of the BHMA CGA members had reviewed the draft AHC MOE language individually without identifying concern or opportunities for improvement. But when together in Orlando, the BHMA members identified several opportunities for further revision to the AHC proposals.

We've captured our suggestions for additional considerations in this proposal. We're not wanting to circumvent the work of the AHC and CTC; that's why several of us have been attending the AHC and CTC meetings and phone calls. We just did not recognize some of the opportunities while reviewing the language individually, and only when the BHMA CGA committee got together for – what we thought would be – a quick final review, did we realize several concerns and opportunities for revisions.

Cost Impact: None.

E75-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7 #2-E-Woestman.doc

E76 – 12

1008.1.9.7(New) [IFC [B] 1008.1.9.7(New)]

Proponent: Bryan M Romney, Building Official, University of Utah, Salt Lake City, Utah, representing self

Add new text as follows:

1008.1.9.7 (IFC [B] 1008.1.9.7) Security locking arrangements. Approved special security egress locking systems shall be permitted on Group A occupancies including, but not limited to, museums, art galleries, special collections libraries and courtrooms; and Group B or M occupancies; for doors in the means of egress serving rooms or spaces where security needs of persons or building contents required such locking. Special egress locks shall be permitted in these occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from an approved location that is constantly attended when the building is occupied.
4. Doors equipped with a security locking arrangement are monitored by either direct line of sight or remote monitoring from the constantly attended station.
5. A building occupant shall not be required to pass through more than one door equipped with a special security egress locking system before entering an exit.
6. The procedures for the operation of the special security egress locking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
7. All security staff or persons identified in the procedures for Item 6 shall have the keys, codes, or other means necessary to operate the locking devices.
8. Emergency lighting shall be provided at the door.

(Renumber subsequent sections)

Reason: Chapter 10 does not provide a method for special locking or controlled egress except for Group I-1 and I-3 Occupancies. Other occupancy groups have needs for special locking arrangements either for securing persons or building contents. Examples include courtrooms where people poising a flight risk need special secure egress considerations. Research labs and animal housing facilities frequently require controlled egress systems such as card of biometric ingress and egress control systems. Libraries with rare book collections, art galleries, museums or mercantile occupancies where building contents area at risk of being stolen have needs for special security egress locking systems. This code addition would permit the code official to approve special locking arrangements in other occupancy groups where a demonstrated need exists. The procedure by which the special locking arrangement functions is to be reviewed and approved by the code official as outlined in Item 6. This item would allow the code official to approve special security egress locking systems under prescriptive requirement of Chapter 10 without having to approve an alternate design or method outlined in Section 104.11. This code addition represents a significantly more defensible code provisions than the more interpretive alternative design route. This code addition allows an already existing code provisions for controlled egress doors in Group I-2 occupancies to be allowed for other occupancy groups where a demonstrated need exists. No new or unproven code protocol is created in this code addition, only an existing, proven, and verified provision is being extended to other occupancy groups which for years have had critically security needs not allowed by the code.

Cost Impact: No initial construction cost impact. The IFC may require ongoing inspections of the Chapter 4 emergency planning and preparedness protocol compliance.

E76-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.7-E-ROMNEY.doc

E77-12
1008.1.9.8, 1008.1.9.9 (IFC [B] 1008.1.9.8, 1008.1.9.9)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.8 (IFC [B] 1008.1.9.8) Access controlled egress doors. The entrance doors in a means of egress in buildings with an occupancy in Groups A, B, E, I-1, I-2, I-4, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in groups A, B, E, I-1, I-2, I-4, M, R-1 or R-2 are permitted to be equipped with an approved entrance and egress access control system, listed in accordance with UL 294, which shall be installed in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that the part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016mm to 1219mm) vertically above the floor and within 5 feet (1524mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of the access control system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, E, or M shall not be secured from the egress side during periods that the building is open to the general public.

1008.1.9.9 (IFC [B] 1008.1.9.9) Electromagnetically locked egress doors. Doors in the *means of egress* in buildings with an occupancy in Group A, B, E, I-1, I-2, I-4, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, I-1, I-2, I-4, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch and meets the requirements below:

1. The listed hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware directly interrupts the power to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.
5. Where panic or *fire exit hardware* is required by Section 1008.1.10, operation of the listed panic or *fire exit hardware* also releases the electromagnetic lock.

Reason: Group I-1 and I-2 include patients where they may be a concern for elopement. In day care, there is the concern of children perhaps leaving the facility. These types of systems allow for some control, while at the same time allowing free egress during an emergency.

If the correlative change for Group R-4, Condition 1 and Condition 2 is successful, a public comment regarding the application of these types of locking arrangements may be submitted.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: Increase

E77-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.8-E-BALDASSARRA-CTC.docx

E78-12
1008.1.9.8 (IFC [B] 1008.1.9.8)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1008.1.9.8 (IFC [B] 1008.1.9.8) ~~Access controlled~~ Motion sensor release of electromagnetically locked egress doors. Electromagnetically locked ~~The entrance~~ doors located in a means of egress in buildings with an occupancy in Groups A, B, E, I-2, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in groups A, B, E, I-2, M, R-1 or R-2 are permitted ~~to be equipped with an approved entrance and egress access control system, listed in accordance with UL 294, which shall be~~ where installed and operated in accordance with all of the following criteria:

1. A motion sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to ~~that~~ the lock ~~part of the access control system which locks the doors~~ shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016mm to 1219mm) vertically above the floor and within 5 feet (1524mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of ~~the access control system~~ other electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, E, or M shall ~~not be secured from the~~ always allow immediate free egress ~~side~~ during periods that the building is open to the general public.
7. All components of the door locking system shall be listed in accordance with UL 294.

Reason: This code was originally proposed to NFPA, UBC/UFC, and BOCA as an **alternative** way to release electromagnetic locks. It came from Washington, D.C. security contractors in the early 1980s when faced with installing electromagnetic locks on hundreds of all glass doors on defense contractors' facilities. There was no way to install bars with switches and no way to conceal the wiring. The title, Access Controlled Egress Doors, **meant** that access to free egress was controlled. It had nothing to do with the (then) new *electronic access control systems.*

The code addressed fire safety by taking aspects of devices not allowed and making them safer when used together. Buttons, once special knowledge, were given specific placement parameters and requirements to break the power to the lock, directly; the somewhat unreliable motion sensor was backed up by the button; the 30 second re-triggerable and independent timer attached to the button protected against CPU failure and allowed 30 seconds before relocking so the disabled could get through the door; and the connection to the fire system meant that the door would unlock upon alarm. It was an alternate code, designed to be used sparingly and in certain situations.

This code is used heavily in hospitals, but its application is often misunderstood. It is time to clean up this code by eliminating confusing references to *access control systems*, directly or implied. Access has never been an issue for the codes, except in high-rise stair towers.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E78-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.8-E-WILLIAMS-ADHOC.doc

E79 – 12
1008.1.9.8 (IFC [B] 1008.1.9.8)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.9.8 (IFC [B] 1008.1.9.8) ~~Access controlled~~ Electrically locked egress doors. Electically locked ~~The entrance~~ doors without a door mounted manual lock release located in a means of egress in buildings with an occupancy in Groups A, B, E, I-2, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in groups A, B, E, I-2, M, R-1 or R-2 ~~are~~ shall be permitted ~~to be equipped with an approved entrance and egress access control system, listed in accordance with UL 294, which shall be~~ where installed and operated in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to ~~that~~ the lock ~~part of the access control system which locks the doors~~ shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016mm to 1219mm) vertically above the floor and within 5 feet (1524mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of the ~~access control~~ locking system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, E, or M shall ~~not be secured from the~~ always allow immediate free egress ~~side~~ during periods that the building is open to the general public.
7. The components of the door locking system shall be listed in accordance with UL 294.

Reason: Changes above illustrate BHMA's suggested revisions from the 2012 IBC incorporating the ICC AHC MOE work group's proposed revisions, and further BHMA revisions. Revisions are to the main paragraph, Items 1, 3 and 7.

The doors included in this section utilize electrical components in their locking systems to help ensure egress. These systems use a sensor to recognized the presence of a pedestrian, and then unlock the electrical lock (such as an electromagnetic lock) but these electrical locking systems are also required to be unlockable by a manually operated button mounted on the wall on the egress side of the door (Item 3 of the criteria). Regarding the sensors, the sensor technologies used with these doors may not technically be a motion sensor.

Access-controlled egress doors are commonly configured without a door-mounted manual lock release on the egress side such as panic hardware. These doors usually require a magnetic card or similar instrument for authorized entry, and the absence of the door-mounted manual lock release on the egress side prevents a person on the outside from inserting a wire or similar tool between the gaps in the door edges to release the lock.

The other revisions are essentially editorial or help to clarify the intent.

Background: the Builders Hardware Manufacturers Association (BHMA) members have been observing the AHC and CTC meetings and activities with most interest in the potential code proposals that may have implications to the means of egress, and to doors and door hardware requirements.

The BHMA Codes and Government Affairs (CGA) committee met immediately after the Orlando ICC AHC meeting for a final look-see at the proposed language. Many of the BHMA CGA members had reviewed the draft AHC MOE language individually without identifying concern or opportunities for improvement. But when together in Orlando, the BHMA members identified several opportunities for further revision to the AHC proposals.

We've captured our suggestions for additional considerations in this proposal. We're not wanting to circumvent the work of the AHC and CTC; that's why several of us have been attending the AHC and CTC meetings and phone calls. We just did not recognize some of the opportunities while reviewing the language individually, and only when the BHMA CGA committee got together for – what we thought would be – a quick final review, did we realize several concerns and opportunities for revisions.

Cost Impact: None.

E79-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.8-E-Woestman.doc

E80 – 12
1008.1.9.8 (IFC [B] 1008.1.9.8)

Proponent: Robert Trotter, representing Tennessee Code Development Committee (bobtrotter1023@aol.com)

Revise as follows:

1008.1.9.8 (IFC [B] 1008.1.9.8) Access-controlled egress doors. The entrance doors in a means of egress in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Groups A, B, E, M, R-1 and R-2 are permitted to be equipped with an approved entrance and egress access control system, listed in accordance with UL 294, which shall be installed in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads “PUSH TO EXIT.” When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of the access control system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. ~~Entrance doors in buildings with an occupancy in Group A, B, E or M shall not be secured from the egress side during periods that the building is open to the general public.~~

Reason: The sixth criterion is redundant and should be removed from the code. The first five requirements satisfactorily meet the needs for access-controlled egress doors. The doors are not secured from the egress side when the first five criterions are met.

Cost Impact: The code change proposal will not increase the cost of construction.

E80-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.8-E-Trotter.doc

E81-12
1008.1.9.9 (IFC [B] 1008.1.9.9)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

1008.1.9.9 (IFC [B] 1008.1.9.9) Electromagnetically locked egress doors. Doors in the *means of egress* in buildings with an occupancy in Group A, B, E, I-2, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, I-2, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch and meet the requirements below :

1. The listed hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware directly interrupts the power to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.
5. Where panic or *fire exit hardware* is required by Section 1008.1.10, operation of the listed panic or *fire exit hardware* also releases the electromagnetic lock.

Reason: The addition of I-2 is necessary since so many of these health care facilities use electromagnetic locks for security and personnel safety, something that 1008.1.9.8 cannot provide.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

Cost Impact: None

E81-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.9#2-E-WILLIAMS-ADHOC.doc

E82-12
1008.1.9.9 (IFC [B] 1008.1.9.9)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

1008.1.9.9 (IFC [B] 1008.1.9.9) Door hardware release of electromagnetic locks on ~~Electromagnetically locked~~ egress doors. Doors in the *means of egress* in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with ~~listed~~ hardware that incorporates a built-in switch and ~~meet the requirements below~~ are installed and operated in accordance with Items 1 through 6 below:

1. The ~~listed~~ hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The ~~listed~~ hardware is capable of being operated with one hand.
3. Operation of the ~~listed~~ hardware directly interrupts the power to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the ~~listed~~ hardware automatically unlocks the door.
5. Where panic or *fire exit hardware* is required by Section 1008.1.10, operation of the ~~listed~~ panic or *fire exit hardware* also releases the electromagnetic lock.
6. All components of the door locking system shall be listed in accordance with UL 294.

Reason: The title change is to prevent confusion between the two types of releasing systems for electromagnetic locks as both codes, 1008.1.9.8 and 1008.1.9.9, detail these requirements which are very different from each other. The remainder of the change is editorial for consistency with other sections.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

Cost Impact: None

E82-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.9-E-WILIAMS-ADHOC.doc

E83 – 12

1008.1.9.9 (IFC [B] 1008.1.9.9)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.9.9 (IFC [B] 1008.1.9.9) Electromagnetically locked egress doors. Doors in the *means of egress* in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with ~~listed~~ hardware that incorporates a built-in switch and ~~meet the requirements below~~ are installed and operated in accordance with Items 1 through 6 below:

1. The ~~listed~~ hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The ~~listed~~ hardware is capable of being operated with one hand.
3. Operation of the ~~listed~~ hardware directly interrupts the power to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the ~~listed~~ hardware automatically unlocks the door.
5. Where panic or *fire exit hardware* is required by Section 1008.1.10, operation of the ~~listed~~ panic or *fire exit hardware* also releases the electromagnetic lock.
6. The components of the door locking system shall be listed in accordance with UL 294.

Reason: Changes above illustrate BHMA's suggested revisions from the 2012 IBC incorporating the ICC AHC MOE work group's proposed revisions, and further BHMA revisions. After further review, BHMA members suggest leaving the name of the section as it is in the 2012 IBC. There is a slight change to Item 6 –'the' instead of 'all'.

Background: the Builders Hardware Manufacturers Association (BHMA) members have been observing the AHC and CTC meetings and activities with most interest in the potential code proposals that may have implications to the means of egress, and to doors and door hardware requirements.

The BHMA Codes and Government Affairs (CGA) committee met immediately after the Orlando AHC meeting for a final look-see at the proposed AHC language. Many of the BHMA CGA members had reviewed the draft AHC MOE language individually without identifying concern or opportunities for improvement. But when together in Orlando, the BHMA members identified several opportunities for further revision to the AHC proposals.

We've captured our suggestions for additional considerations in this proposal. We're not wanting to circumvent the work of the AHC and CTC; that's why several of us have been attending the AHC and CTC meetings and phone calls. We just did not recognize some of the opportunities while reviewing the language individually, and only when the BHMA CGA committee got together for – what we thought would be – a quick final review, did we realize several concerns and opportunities for revisions.

Cost Impact: None.

E83-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.9-E-Woestman.doc

E84 – 12
1008.1.10 (IFC [B] 1008.1.10)

Proponent: John Woestman, Kellen Company, representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

Revise as follows:

1008.1.10 (IFC [B] 1008.1.10) Panic and fire exit hardware. Doors serving a Group H occupancy and doors serving rooms or spaces with an *occupant load* of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock unless it is *panic hardware* or *fire exit hardware*.

~~Exception~~ Exceptions:

1. A main *exit* of a Group A occupancy shall be permitted to be locking in accordance ~~compliance~~ with Section 1008.1.9.3, Item 2.
2. Doors serving a Group A or E occupancy shall be permitted to be electromagnetically locked in accordance with Section 1008.1.9.9.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with *exit* or *exit access* doors shall be equipped with *panic hardware* or *fire exit hardware*. The doors shall swing in the direction of egress travel.

Reason: A potential interpretation of the requirements of 1008.1.10 is to not allow any other lock or latch where panic hardware or fire exit hardware is required. But 1008.1.9.9 allows an electromagnetic lock where panic or fire exit hardware is required by 1008.1.10. The proposed language clarifies electromagnetic locks are permitted where panic or fire exit hardware is required.

The revision to the existing exception is correlative and editorial only.

Cost Impact: None.

E84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008.1.9.10-E-Woestman.doc

E85 – 12

1022.6 (New), 1023.7 (New), 1025.4 (New) [IFC 1022.6 (New), 1023.7 (New), 1025.4 (New)]

Proponent: Lee J. Kranz, City of Bellevue, Washington, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

Add new text as follows:

<u>**1022.6 (IFC [B] 1022.6) Standpipes.** Class 1 standpipe hose connections shall be provided in accordance with Item 1 or 5 of Section 905.4 and NFPA 14.</u>

(Renumber subsequent sections)

<u>**1023.7 (IFC [B] 1023.7) Standpipes.** Class 1 standpipe hose connections shall be provided in accordance with Item 3 of Section 905.4 and NFPA 14.</u>

<u>**1025.4 (IFC [B] 1025.5) Standpipes.** Class 1 standpipe hose connections shall be provided in accordance with Item 2 of Section 905.4 and NFPA 14.</u>

(Renumber subsequent sections)

Reason: Placing references to Section 905.4 and NFPA 14 standpipe requirements in exit stairways, horizontal exits and exit passageways will help designers and reviewers to include this requirement early in the design process. During the means of egress design process, the requirement for standpipes for horizontal exits and exit passageways are frequently overlooked and may have significant cost impacts to correct. Including the standpipe references in Sections 1023 and 1025 will make the design team aware of the requirement early in the design process and help insure cost impacts are considered at the appropriate time. Adding the requirement in Section 1022 is for consistency.

The intent is to have an IFC change to clarify that standpipes should be located within the enclosure for interior exit stairways. Literally the current text, by saying all required stairways, would require standpipes on exit access stairways and exterior exit stairway. If it is felt that standpipes should be provided in these locations, a modification would be to add this same language in a new Section 1009.3.1.8 for exit access stairways and 1026.7 for exterior exit stairways.

Cost Impact: None

E85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1023.7-E-Kranz.doc

E86 – 12

1007.1, 1009.4, 1009.7.2, 1009.7.4, 1009.8, 1009.10, 1009.15, 1010.3, 1028.6.1, 1028.6.3, 1028.11.2, 1028.13, 1028.13.2 (IFC [B] 1007.1, 1009.4, 1009.7.2, 1009.7.4, 1009.8, 1009.10, 1009.15, 1010.3, 1028.6.1, 1028.6.3, 1028.11.2, 1028.13, 1028.13.2)

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing self (geneb@codeconsultants.com)

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with ~~sloped~~ ramped aisles or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

1009.4 (IFC [B] 1009.4) Width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.12.
3. ~~Aisle stairs~~ Stepped aisles complying with Section 1028.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

1009.7.2 (IFC [B] 1009.7.2) Riser height and tread depth. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the nosings of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's nosing. Winder treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. Alternating tread devices in accordance with Section 1009.13.
2. Ship ladders in accordance with Section 1009.14.
3. Spiral stairways in accordance with Section 1009.12.

4. ~~Aisle stairs~~ Stepped aisles in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1028.11.2.
5. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7 ¾ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing projection not less than ¾ inch (19.1 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
6. See Section 3404.1 for the replacement of existing stairways.
7. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

1009.7.4 (IFC [B] 1009.7.4) Dimensional uniformity. Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed $^3/_8$ inch (9.5 mm) in any flight of stairs. The greatest winder tread depth at the walkline within any flight of stairs shall not exceed the smallest by more than $^3/_8$ inch (9.5 mm).

Exceptions:

1. Nonuniform riser dimensions of ~~aisle stairs~~ stepped aisles complying with Section 1028.11.2.
2. Consistently shaped winders, complying with Section 1009.7, differing from rectangular treads in the same stairway flight.

Where the bottom or top riser adjoins a sloping public way, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of stairway width. The nosings or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other nosing marking provided on the stair flight. The distinctive marking stripe shall be visible in descent of the stair and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

1009.8 (IFC [B] 1009.8) Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum width measured perpendicular to in the direction of travel equal to the width of the stairway. Where the stairway has a straight run the depth need not exceed 48 inches (1219 mm). Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exception: ~~Aisle stairs~~ Stepped aisles complying with Section 1028.

1009.10 (IFC [B] 1009.10) Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

1. ~~Aisle stairs~~ Stepped aisles complying with Section 1028.

2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. Spiral stairways used as a means of egress from technical production areas.

1009.15 (IFC [B] 1009.15) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for ~~aisle stairs~~ stepped aisles provided in accordance with Section 1028.13.
2. Stairways within dwelling units and spiral stairways are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

1010.3 (IFC [B] 1010.3) Slope. Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedestrian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

Exception: ~~Aisle ramp~~ The slope of a ramped aisle in a room or space used for assembly purposes shall comply with Section 1028.11.

1028.6.1 (IFC [B] 1028.6.1) Without smoke protection. The clear width of the means of egress shall provide sufficient capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of width for each occupant served shall be provided on ~~stairs~~ stepped aisles having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional ~~stair~~ stepped aisle width for each occupant shall be provided for each 0.10 inch (2.5mm) of riser height above 7 inches (178 mm).
3. Where egress requires ~~stair~~ stepped aisle descent, at least 0.075 inch (1.9 mm) of additional width for each occupant shall be provided on those portions of ~~stair~~ stepped aisle width having no handrail within a horizontal distance of 30 inches (762 mm).
4. Ramped aisles ~~means of egress~~, where slopes are steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.22 inch (5.6 mm) of clear width for each occupant served. Level or ramped aisles ~~means of egress~~, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of clear width for each occupant served.

1028.6.3 (IFC [B] 1028.6.3) Width of means of egress for outdoor smoke-protected assembly seating. The clear width in inches (mm) of aisles and other means of egress shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by ~~aisles and stairs~~ stepped aisles and stairways and multiplied by 0.06 (1.52 mm) where egress is by ~~ramps~~ aisles, ramped aisles, corridors, tunnels or vomitories.

Exception: The clear width in inches (mm) of aisles and other means of egress shall be permitted to comply with Section 1028.6.2 for the number of seats in the outdoor smoke-protected assembly seating where Section 1028.6.2 permits less width.

1028.11.2 (IFC [B] 1028.11.2) Risers. Where the gradient of ~~aisle stairs~~ stepped aisles is to be the same as the gradient of adjoining seating areas, the riser height shall not be less than 4 inches (102 mm) nor more than 8 inches (203 mm) and shall be uniform within each flight.

Exceptions:

1. Riser height nonuniformity shall be limited to the extent necessitated by changes in the gradient of the adjoining seating area to maintain adequate sightlines. Where nonuniformities exceed 3/16 inch (4.8 mm) between adjacent risers, the exact location of such nonuniformities shall be indicated with a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform risers. Such stripe shall be a minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide. The edge marking stripe shall be distinctively different from the contrasting marking stripe.
2. Riser heights not exceeding 9 inches (229 mm) shall be permitted where they are necessitated by the slope of the adjacent seating areas to maintain sightlines.

1028.13 (IFC [B] 1028.13) Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and ~~aisle stairs~~ stepped aisles shall be provided with handrails in compliance with Section 1012 located either at one or both sides of the aisle or within the aisle width.

Exceptions:

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of ~~aisle stair~~ stepped aisles and ~~aisle ramp runs~~ ramped aisles to permit crossovers within the aisles.

1028.13.2 (IFC [B] 1028.13.2) Intermediate handrails. Where handrails are provided in the middle of ~~aisle stairs,~~ stepped aisles there shall be an additional intermediate handrail located approximately 12 inches (305 mm) below the main handrail.

Reason: The intent is to use language that is more common and consistent with the manner in which it is applied. The adjective defines the noun. In all the cases within the code the thing being described is the aisle and the stepped or ramped aspect is the adjective.

Changing the phase "aisle stairs" to "stepped aisles" in multiple locations: Throughout the sections of the code that address aisles, the adjective is used and then the term "aisle" follows, except for this element. There are "cross" aisles and "ramped" aisles but the term is changed to aisle stairs rather than stepped aisles except in one occurrence. The term "stepped aisles" is already used in Section 1007.1, exception #3.

In the code sections that address stairs the term aisle stairs is used but in the exceptions because they are different than regular stairs. The code language should acknowledge this. The code uses the term stair which is defined. But in the stair section of the code, it offers exception after exception that the requirement does not apply to "aisle stairs." If the text indicates that these are not to be treated as stairs, then the code should not be using that term.

Change the phrase "aisle ramp" to "ramped aisles" in three locations: In all conditions except these three, the term used in the code to address these elements is "ramped aisle." These are the only cases where the term is not used consistently. The proposal seeks to make this aspect of the code consistent throughout.

Section 1028.6.3: It is clear that the intent of the language in the exception to Section 1028.6.3 is to address the vertical elements for aisles. Consistent with the language changes proposed, this should be clarified that it is the "stepped" aisles that are being discussed since the following phrase clearly addresses horizontal elements.

This is but another example where the term stairs is inappropriate since it would be confusing to say "aisle stairs and stairs." If the aisle stairs are already stairs then the expression is redundant. If they are different then the terminology should address that.

Cost Impact: The code change proposal will not increase the cost of construction.

E86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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E87-12

1007.1, 1009, 1010, 1012, 1013, 1028 (IFC [B] 1007.1, 1009, 1010, 1012, 1013, 1028)

Proponent: S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

SECTION 1009 (IFC [B] 1009)
STAIRWAYS

1009.1 (IFC [B] 1009.1) General. Stairways serving occupied portions of a building shall comply with the requirements of this section.

> <u>**Exception:** Within rooms or spaces used for assembly purposes, aisle stairs shall comply with Section 1028.</u>

1009.4 (IFC [B] 1009.4) Width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.12.
3. ~~Aisle stairs complying with Section 1028.~~
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

1009.7 (IFC [B] 1009.7) Stair treads and risers. Stair treads and risers shall comply with Sections 1009.7.1 through 1009.7.5.3.

1009.7.2 (IFC [B] 1009.7.2) Riser height and tread depth. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the nosings of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's nosing. Winder treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. Alternating tread devices in accordance with Section 1009.13.
2. Ship ladders in accordance with Section 1009.14.
3. Spiral stairways in accordance with Section 1009.12.
4. ~~Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1028.11.2.~~

~~5~~<u>4</u>. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7 ¾ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing projection not less than ¾ inch (19.1 mm) but not more than 1 ¼ inches

(32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).

~~6~~5. See Section 3404.1 for the replacement of existing stairways.

~~7~~6. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

1009.7.4 (IFC [B] 1009.7.4) Dimensional uniformity. Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 3/8 inch (9.5 mm)in any flight of stairs. The greatest winder tread depth at the walk line within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Exceptions:

~~1. Nonuniform riser dimensions of aisle stairs complying with Section 1028.11.2.~~

~~2~~1. Consistently shaped winders, complying with Section 1009.7, differing from rectangular treads in the same stairway flight.

Where the bottom or top riser adjoins a sloping public way, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of stairway width. The nosings or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other nosing marking provided on the stair flight. The distinctive marking stripe shall be visible in descent of the stair and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

1009.8 (IFC [B] 1009.8) Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum width measured perpendicular to in the direction of travel equal to the width of the stairway. Where the stairway has a straight run the depth need not exceed 48 inches (1219 mm). Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exception: ~~Aisle stairs complying with Section 1028.~~

1009.10 (IFC [B] 1009.10) Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

1. ~~Aisle stairs complying with Section 1028~~.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. Spiral stairways used as a means of egress from technical production areas.

1009.15 (IFC [B] 1009.15) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

~~1. Handrails for aisle stairs provided in accordance with Section 1028.13.~~

~~2~~1. Stairways within dwelling units, and spiral stairways are permitted to have a handrail on one side only.

~~3~~2. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.

~~4~~3. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.

~~5~~4. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

1009.16 (IFC [B] 1009.16) Guards. Guards shall be provided where required by Section 1013 and shall be constructed in accordance with Section 1013.

SECTION 1010 (IFC [B] 1010)
RAMPS

1010.1 (IFC [B] 1010.1) Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

Exceptions:

~~1.~~ ~~Other than ramps that are part of the accessible routes providing access in accordance with Sections 1108.2 through 1108.2.4 and 1108.2.6,~~ Ramped aisles within assembly rooms or spaces shall ~~conform~~ comply with the provisions in Section 1028~~.11~~.

~~2~~1. Curb ramps shall comply with ICC A117.1.

~~3~~2. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.4 through 1010.10 when they are not an accessible route serving accessible parking spaces, other required accessible elements or part of an accessible means of egress.

1010.3 (IFC [B] 1010.3) Slope. Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedestrian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

~~**Exception:** Aisle ramp slope in a room or space used for assembly purposes shall comply with Section 1028.11~~.

1010.9 (IFC [B] 1010.9) Handrails. Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides. Handrails shall comply with Section 1012.

~~**Exception:** Handrails for ramped aisles provided in accordance with Section 1028.13.~~

1010.10 (IFC [B] 1010.10) Edge protection. Edge protection complying with Section 1010.10.1 or 1010.10.2 shall be provided on each side of ramp runs and at each side of ramp landings.

Exceptions:

1. Edge protection is not required on ramps that are not required to have handrails, provided they have flared sides that comply with the ICC A117.1 curb ramp provisions.
2. Edge protection is not required on the sides of ramp landings serving an adjoining ramp run or stairway.

3. Edge protection is not required on the sides of ramp landings having a vertical drop off of not more than ½ inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.
4. ~~In assembly spaces with fixed seating, edge protection is not required on the sides of ramps where the ramps provide access to the adjacent seating and aisle accessways.~~

SECTION 1012 (IFC [B] 1012)
HANDRAILS

1012.1 (IFC [B] 1012.1) Where required. Handrails ~~for~~ serving stairways, ~~and~~ ramps, aisle stairs and ramped aisles shall be adequate in strength and attachment in accordance with Section 1607.8. Handrails required for stairways by Section 1009.15 shall comply with Sections 1012.2 through 1012.9. Handrails required for ramps by Section 1010.9 shall comply with Sections 1012.2 through 1012.8. Handrails for aisle stairs and ramped aisles required by Section 1028.13 shall comply with Sections 1012.2 through 1012.8.

1012.2 (IFC [B] 1012.2) Height. Handrail height, measured above stair tread nosings, or finish surface of ramp slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices and ship ladders, measured above tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

Exceptions:

1. When handrail fittings or bendings are used to provide continuous transition between flights the fittings or bendings shall be permitted to exceed the maximum height.
2. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual dwelling units in Group R-2 occupancies; when handrail fittings or bendings are used to provide continuous transition between flights, transition at winder treads, transition from handrail to guard, or when used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.
3. Handrails on top of a guard where permitted along aisle stairs and ramped aisles in accordance with Section 1028.13.

1012.4 (IFC [B] 1012.4) Continuity. Handrail gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. Handrails within dwelling units are permitted to be interrupted by a newel post at a turn or landing.
2. Within a dwelling unit, the use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail that do not project horizontally beyond the sides of the handrail within 11/2 inches (38 mm) of the bottom of the handrail shall not be considered obstructions. For each 1/2 inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 11/2 inches (38 mm) shall be permitted to be reduced by 1/8 inch (3 mm).
4. Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.
5. Handrails serving aisle steps or ramped aisles are permitted to be discontinuous in accordance with 1028.13.1.

1012.6 (IFC [B] 1012.6) Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight. Where handrails are not continuous between flights the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrails shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. The extensions of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps.

Exceptions:

1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser.
2. ~~Aisle~~ handrails serving aisles in rooms or spaces used for assembly purposes are permitted to comply with the handrail extensions in accordance with Section 1028.13.
3. Handrails for alternating tread devices and ship ladders are permitted to terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices are not required to be continuous between flights or to extend beyond the top or bottom risers.

1012.8 (IFC [B] 1012.8) Projections. On ramps and on ramped aisles that are part of an accessible route, the clear width between handrails shall be 36 inches (914 mm) minimum. Projections into the required width of aisles, stairways and ramps at each side shall not exceed 41/2 inches (114 mm) at or below the handrail height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1009.5. Projections due to intermediate handrails shall not constitute a reduction in the egress width.

SECTION 1013 (IFC [B] 1013)
GUARDS

1013.1 (IFC [B] 1013.1) General. Guards shall comply with the provisions of Section 1013.2 through 1013.7. Operable windows with sills located more than 72 inches (1.83 m) above finished grade or other surface below shall comply with Section 1013.8

1013.2 (IFC [B] 1013.2) Where required. Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with Section 1607.8.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross aisles ~~where guards~~ in accordance with Section 1028.14.1 ~~are permitted and provided~~.

1013.3 (IFC [B] 1013.3) Height. Required guards shall not be less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces,
2. On stairs and aisle stairs, from the line connecting the leading edges of the tread nosings, and
3. On ramps and ramped aisles, from the ramp surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual dwelling units in occupancies in Group R-2 not more than three stories above grade in height with separate means of egress, required guards shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces or fixed seating.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
3. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
4. The guard height in assembly seating areas shall be permitted to comply with Section 1028.14.
5. Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

1013.4 (IFC [B] 1013.4) Opening limitations. Required guards shall not have openings which allow passage of a sphere 4 inches (102 mm) in diameter from the walking surface to the required guard height.

Exceptions:

1. From a height of 36 inches (914 mm) to 42 inches (1067 mm), guards shall not have openings which allow passage of a sphere 43/8 inches (111 mm) in diameter.
2. The triangular openings at the open sides of a stair, formed by the riser, tread and bottom rail shall not allow passage of a sphere 6 inches (152 mm) in diameter.
3. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall not have openings which allow passage of a sphere 21 inches (533 mm)in diameter.
4. In areas that are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices and ship ladders, guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
5. In assembly seating areas, guards required at the end of aisles in accordance with 1028.14.3 ~~where they terminate at a fascia of boxes, balconies and galleries~~ shall not have openings which allow passage of a sphere 4 inches in diameter (102 mm) up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, guards shall not have openings which allow passage of a sphere 8 inches (203 mm) in diameter.
6. Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, guards on the open sides of stairs shall not have openings which allow passage of a sphere 43/8 (111 mm)inches in diameter.

SECTION 1028 (IFC [B] 1028)
ASSEMBLY

1028.1 (IFC [B] 1028.1) General. A room or space used for assembly purposes which contain seats, tables, displays, equipment or other material shall comply with this section.

1028.1.1 (IFC [B] 1028.1.1) Bleachers. Bleachers, grandstands and folding and telescopic seating, that are not building elements, shall comply with ICC 300.

1028.6 (IFC [B] 1028.6) Width of means of egress for assembly. The clear width of aisles and other means of egress comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

1028.6.1 (IFC [B] 1028.6.1) Without smoke protection. The clear width of the means of egress <u>for assembly seating</u> <u>without smoke protection</u> shall provide sufficient capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of <u>aisle</u> width for each occupant served shall be provided on <u>aisle</u> stairs having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional <u>aisle</u> ~~stair~~ width for each occupant shall be provided for each <u>aisle stair with</u> 0.10 inch (2.5mm)of riser height above 7 inches (178 mm).
3. Where egress requires aisle stair descent, at least 0.075 inch (1.9 mm) of additional <u>aisle</u> width for each occupant shall be provided on those portions of <u>aisle</u> stair width having no handrail within a horizontal distance of 30 inches (762 mm).
4. Ramped <u>aisles</u> ~~means of egress~~, where slopes are steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.22 inch (5.6 mm) of clear <u>aisle</u> width for each occupant served. Level or ramped <u>aisles or other</u> means of egress, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of clear width for each occupant served.

1028.6.2 (IFC [B] 1028.6.2) Smoke-protected seating. The clear width of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for smoke-protected assembly seating.

> **Exception:** For an outdoor smoke-protected assembly seating with an occupant load not greater than 18,000, the clear width shall be determined using the factors in Section 1028.6.3.

TABLE 1028.6.2 (IFC [B] TABLE 1028.6.2)
WIDTH OF AISLES FOR SMOKE-PROTECTED ASSEMBLY

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY SEATING	INCHES OF CLEAR WIDTH PER SEAT SERVED			
	Stairs and aisle ~~steps~~ <u>stairs</u> with handrails within 30 inches	Stairs and aisle ~~steps~~ <u>stairs</u> without handrails within 30 inches	Passageways, doorways<u>,</u> ~~and~~ ramps <u>and ramped aisles</u> not steeper than 1 in 10 in slope	~~Ramps~~ <u>Ramped aisles</u> steeper than 1 in 10 in slope
Equal to or less than 5,000	0.200	0.250	0.150	0.165
10,000	0.130	0.163	0.100	0.110
15,000	0.096	0.120	0.070	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.060	0.075	0.044	0.048

For SI: 1 inch = 25.4 mm.

1028.6.3 (IFC [B] 1028.6.3) Width of means of egress for outdoor smoke-protected assembly seating. The clear width in inches (mm) of aisles and other means of egress shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by ~~aisles and~~ <u>aisle</u> stairs and multiplied by 0.06 (1.52 mm) where egress is by <u>level aisles and</u> ~~ramps~~ <u>ramped aisles</u>, corridors, tunnels or vomitories.

Exception: The clear width in inches (mm) of aisles and other means of egress shall be permitted to comply with Section 1028.6.2 for the number of seats in the outdoor smoke-protected assembly seating where Section 1028.6.2 permits less width.

1028.7 (IFC [B] 1028.7) Travel distance. Exits and aisles shall be so located that the travel distance to an exit door shall not be greater than 200 feet (60 960 mm) measured along the line of travel in nonsprinklered buildings. Travel distance shall not be more than 250 feet (76 200 mm) in sprinklered buildings. Where aisles are provided for seating, the distance shall be measured along the aisles and aisle accessway without travel over or on the seats.

Exceptions:

1. Smoke-protected assembly seating: The travel distance from each seat to the nearest entrance to a vomitory or concourse shall not exceed 200 feet (60 960 mm). The travel distance from the entrance to the vomitory or concourse to a ~~stair~~ stairway, ramp or walk on the exterior of the building shall not exceed 200 feet (60 960 mm).
2. Open-air seating: The travel distance from each seat to the building exterior shall not exceed 400 feet (122 m). The travel distance shall not be limited in facilities of Type I or II construction.

1028.9 (IFC [B] 1028.9) Assembly aisles are required. Every occupied portion of any building, room or space used for assembly purposes that contains seats, tables, displays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access doorways in accordance with this section. ~~Aisle accessways for tables and seating shall comply with Section 1028.10.1~~.

1028.9.1 (IFC [B] 1028.9.1) Minimum aisle width. The minimum clear width for aisles shall be as shown:

1. Forty-eight inches (1219 mm) for aisle stairs having seating on each side

.

   Exception: Thirty-six inches (914 mm) where the aisle stairs serves less than 50 seats.

2. Thirty-six inches (914 mm) for aisle stairs having seating on only one side.

   Exception: Twenty-three inches (584 mm) between an aisle stair handrail and seating where an aisle stairs does not serve more than five rows on one side.

3. Twenty-three inches (584 mm) between an aisle stair handrail or guard and seating where the aisle stairs is subdivided by a handrail.
4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

   Exceptions:

   1. Thirty-six inches (914 mm) where the aisle serves less that 50 seats.
   2. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.

5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

   Exception: For other than ramped aisles that serve as part of an accessible route, Thirty inches (762 mm) where the ramped aisle does not serve more than 14 seats.

1028.9.2 (IFC [B] 1028.9.2) Aisle catchment area ~~width~~. The aisle width shall provide sufficient egress capacity for the number of persons accommodated by the catchment area served by the aisle. The catchment area served by an aisle is that portion of the total space that is served by that section of the aisle. In establishing catchment areas, the assumption shall be made that there is a balanced use of all means of egress, with the number of persons in proportion to egress capacity.

1028.9.5 (IFC [B] 1028.9.5) ~~Assembly aisle termination~~ <u>Dead end aisles</u>. Each end of an aisle shall ~~terminate~~ <u>be continuous to a</u> ~~at~~ cross aisle, foyer, doorway, vomitory or concourse having access to an exit.

Exceptions:

1. Dead-end aisles shall not be greater than 20 feet (6096 mm) in length.
2. Dead-end aisles longer than 20 feet (6096 mm) are permitted where seats beyond the 20-foot (6096 mm) dead-end aisle are no more than 24 seats from another aisle, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row.
3. For smoke-protected assembly seating, the dead-end aisle length of vertical aisles shall not exceed a distance of 21 rows.
4. For smoke-protected assembly seating, a longer dead-end aisle is permitted where seats beyond the 21-row dead-end aisle are not more than 40 seats from another aisle, measured along a row of seats having an aisle accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row.

<u>**1028.9.6 (IFC [B] 1028.9.6) Aisle measurement.** The clear width for aisles shall be measured to walls, edges of seating and tread edges except for permitted projections.</u>

<u>**Exception:** The clear width of aisles adjacent to seating at table shall be permitted to be measured in accordance with 1028.10.1</u>

~~1028.9.6~~ <u>1028.9.6.1</u> (IFC [B] ~~1028.9.6~~ <u>1028.9.6.1)</u> Assembly aisle obstructions. There shall be no obstructions in the required width of aisles ~~except for handrails as provided in Section 1028.13~~.

<u>**Exception**: Handrails are permitted to project into the required width of aisle stairs and ramped aisles in accordance with Section 1012.8.</u>

<u>**1028.9.7 (IFC [B] 1028.9.7) Construction:** All aisles, aisle stairs and ramped aisles shall be built of materials consistent with the types permitted for the type of construction of the building.</u>
<u>**Exception:** Wood handrails shall be permitted for all types of construction.</u>

<u>**1028.9.7.1 (IFC [B] 1028.9.7.1) Walking surface.** The surface of aisles, aisle stairs and ramped aisles shall be of slip-resistant materials that are securely attached. In addition, the surface for aisle stairs shall comply with Section 1009.9.1.</u>

<u>**1028.9.7.2 (IFC [B] 1028.9.7.2) Outdoor conditions.** Outdoor aisles, aisle stairs and ramped aisles and outdoor approaches to aisles, aisle stairs and ramped aisles shall be designed so that water will not accumulate on the walking surface.</u>

1028.10 (IFC [B] 1028.10) Aisle accessways. Aisle accessways for seating at tables shall comply with Section 1028.10.1. Aisle accessways for seating in rows shall comply with Section 1028.10.2.

1028.10.1 (IFC [B] 1028.10.1) Seating at tables. Where seating is located at a table or counter and is adjacent to an aisle or aisle accessway, the measurement of required clear width of the aisle or aisle accessway shall be made to a line 19 inches (483 mm) away from and parallel to the edge of the table or counter. The 19-inch (483 mm) distance shall be measured perpendicular to the side of the table or counter. In the case of other side boundaries for aisle or aisle accessways, the clear width shall be measured to walls, edges of seating and tread edges, ~~except that handrail projections are permitted~~.

Exception: Where tables or counters are served by fixed seats, the width of the <u>aisles or</u> aisle accessway shall be measured from the back of the seat.

1028.10.2.2 (IFC [B] 1028.10.2.2) Single access. For rows of seating served by an aisle or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch (15.2 mm) for every additional seat beyond seven seats, but the minimum clear width is not required to exceed 22 inches (559 mm).

> **Exception:** For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table 1028.10.2.1.

1028.11 (IFC [B] 1028.11) Assembly aisle walking surfaces. Ramped aisles shall comply with 1028.11.1 through 1028.11.1.3. Aisle stairways shall comply with Section 1028.11.2 through 1028.11.2.4.

1028.11.1 (IFC [B] 1028.11.1) Ramped aisles. Aisles that are sloped more than one unit vertical in 20 horizontal (5 percent slope) shall be considered a ramped aisle. Ramped aisle that serve as part of an accessible route in accordance with Sections 1007 and 1108.2 shall have a maximum slope of one unit vertical in 12 horizontal (8 percent). The slope of other ramped aisles ~~with a slope~~ shall not exceeding one unit vertical in 8 units horizontal (12.5-percent slope) ~~shall consist of a having a slip-resistant walking surface~~.

1028.11.1.1 (IFC [B] 1028.11.1.1) Cross slope. The slope measured perpendicular to the direction of travel of a ramped aisle shall not be steeper than one unit vertical in 48 units horizontal (2-percent slope).

1028.11.1.2 (IFC [B] 1028.11.1.2) Landings. Ramped aisles shall have landings in accordance with Section 1010.7 through 1010.7.5. Landings for ramped aisles shall be permitted to overlap required aisle or cross aisles.

1028.11.1.3 (IFC [B] 1028.11.1.3) Edge protection. Ramped aisles shall have edge protection in accordance with Section 1010.10 and 1010.10.1.

> **Exception:** In assembly spaces with fixed seating, edge protection is not required on the sides of ramped aisles where the ramped aisles provide access to the adjacent seating and aisle accessways.

1028.11.2 (IFC [B] 1028.11.2) Aisle stairs. Aisles with a slope exceeding one unit vertical in eight units horizontal (12.5-percent slope) shall consist of a series of risers and treads that extends across the full width of aisles and complies with Sections 1028.11.2.1 through 1028.11.~~3~~2.4.

1028.11.2.1 (IFC [B] 1028.11.2.1) Treads. *(no change)*

1028.11.2.2 (IFC [B] 1028.11.2.2) Risers. *(no change)*

1028.11.2.3 (IFC [B] 1028.11.2.3) Tread contrasting marking stripe. *(no change)*

1028.11.2.4 (IFC [B] 1028.11.2.4) Nosing and profile. Nosing and riser profile shall comply with Sections 1009.7.5 through 1009.7.5.3.

1028.12 (IFC [B] 1028.12) Seat stability. *(no change)*

1028.13 (IFC [B] 1028.13) Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails in compliance with Section 1012 located either at one or both sides of the aisle or within the aisle width.

> **Exceptions:**
>
> 1. Handrails are not required for ramped aisles ~~having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and~~ seating on both sides.

2. Handrails are not required if, at the side of the aisle, there is a guard with a top surface that complies with the graspability requirements of handrails in accordance with Section 1012.3.
3. Handrail extensions are not required at the top and bottom of aisle stair and ~~aisle ramp~~ ramped aisle runs to permit crossovers within the aisles.

1028.13.1 (IFC [B] 1028.13.1) Discontinuous handrails. Where there is seating on both sides of the aisle, the handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the handrail shall have rounded terminations or bends.

1028.13.2 (IFC [B] 1028.13.2) ~~Intermediate~~ ~~hand~~rails. Where handrails are provided in the middle of aisle stairs, there shall be an additional ~~intermediate~~ ~~hand~~rail located approximately 12 inches (305 mm) below the main handrail. The rail shall be adequate in strength and attachment in accordance with Section 1607.8.1.2.

1028.14 (IFC [B] 1028.14) Assembly guards. Guards adjacent to seating in a building, room or space used for assembly purposes shall comply with Section 1013 except where permitted by Sections 1028.14.1 through 1028.14.3.

1028.14.1 (IFC [B] 1028.14.1) Cross aisles. Cross aisles located more than 30 inches (762 mm) above the floor or grade below shall have guards in accordance with Section 1013.

Where an elevation change of 30 inches (762 mm) or less occurs between a cross aisle and the adjacent floor or grade below, guards not less than 26 inches (660 mm) above the aisle floor shall be provided.

Exception: Where the backs of seats on the front of the cross aisle project 24 inches (610 mm) or more above the adjacent floor of the aisle, a guard need not be provided.

1028.14.2 (IFC [B] 1028.14.2) Sightline-constrained guard heights. Unless subject to the requirements of Section 1028.14.3, a fascia or railing system in accordance with the guard requirements of Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At bleachers, a guard must be provided where required by ICC 300.

Exception: The height of the guard in front of seating shall be measured from the adjacent walking surface.

1028.14.3 (IFC [B] 1028.14.3) Guards at the end of aisles. A fascia or railing system complying with the guard requirements of Section 1013 shall be provided for the full width of the aisle where the foot of the aisle is more than 30 inches (762 mm) above the floor or grade below. The fascia or railing shall be a minimum of 36 inches (914 mm) high and shall provide a minimum 42 inches (1067 mm) measured diagonally between the top of the rail and the nosing of the nearest tread.

SECTION 1007 (IFC [B] 1007)
ACCESSIBLE MEANS OF EGRESS

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with ~~sloped~~ ramped aisles or ~~stepped aisles~~ aisle stairs, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The purposes of this change are the following:

- To refer to Section 1028 for aisles, aisle stairs and ramped aisles within assembly seating areas. The current text often bounces back and forth between aisle provisions and general requirements for ramps and stairways. Assembly aisles have their own section because they are a unique configuration and some different safety concerns.
- To consistently use the terms aisles, aisle stairs and ramped aisles throughout Chapter 10. The current text is inconsistent, even within Section 1028.
- To make the provisions found in 1009 (stairways), 1010 (ramps) and 1028 (aisles – level, ramped and stepped) consistent in content and references.
- To make handrail and guard requirements equally applicable to stairways, ramps and aisles (level, ramped and stepped) unless specifically addressed (i.e. center handrails on aisle stairs and guards at the front of balconies).

Stairways and ramps, as well as other means of egress, not within the seating area, will continue to be addressed in their appropriate section throughout Chapter 10.

To be more specific by section:

- 1007.1 – be consistent throughout the code using the terms 'ramped aisles' and 'aisle stairs'
- 1009 – by sending the code user to 1028 in 1009.1 at the beginning of stairways for the unique requirements for 'aisle stairs', there is no need for exceptions throughout 1009. (There is a separate change to address the situation where aisle stairs transition directly to stairways without cross aisles or landings)
- 1009.16 (new) – guards are referenced for ramps and aisles; therefore for consistency they should be referenced for stairways.
- 1010 – the same as with stairways, by sending the user to 1028 in 1010.1 at the beginning of ramps for the unique requirements for 'ramped aisles', there is no need for exceptions throughout 1010. The ramped aisles that serve as part of the accessible route within the seating area are addressed in 1028, there is no need to separate them.
- 1012 and 1013 – aisle stairs and ramped aisles will reference the provisions for handrails and guards the same as stairways and ramps. Revisions are for coordination with 1028.13 and 1028.14.
- 1028.9 - the sentence has been relocated to new 1028.9.6
- 1028.9.6 and 1028.9.7 (new) – are adding provisions for aisle stairs and ramped aisles that are consistent with current requirements for stairways and ramps for measurement and construction
- 1028.11 – the current 1028.11 addresses the walking surface for both ramped aisles and aisle stairs in one section, but not as completely as ramps and stairways. The new sections 1028.11 through 1028.11.2.4 both coordinate and clarify requirements for walking surfaces.
- 1028.13 (handrails) and 1028.14 (guards) are coordinated with 1012 (handrails) and (1013) guards.

The BCAC has code changes in dealing with aisles in 1005, 1009, 1017 and 1028 as well as a transition between aisle stairs and stairways. The intent is for all four proposals to correlate; however this change can stand by itself.

Cost Impact: This code change proposal will not increase the cost of construction.

E87-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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E88-12

1009.1, 1009.4, 1009.7.2, 1009.7.4, 1009.8, 1009.10, 1009.15 (IFC [B] 1009.1, 1009.4, 1009.7.2, 1009.7.4, 1009.8, 1009.10, 1009.15)

Proponent: S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

SECTION 1009 (IFC [B] 1009)
STAIRWAYS

1009.1 (IFC [B] 1009.1) General. Stairways serving occupied portions of a building shall comply with the requirements of this section.

> **Exception:** Within rooms or spaces used for assembly purposes, aisle stairs shall comply with Section 1028.

1009.4 (IFC [B] 1009.4) Width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.12.
~~3. Aisle stairs complying with Section 1028.~~
3~~4.~~ Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

1009.7 (IFC [B] 1009.7) Stair treads and risers. Stair treads and risers shall comply with Sections 1009.7.1 through 1009.7.5.3.

1009.7.2 (IFC [B] 1009.7.2) Riser height and tread depth. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the nosings of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's nosing. Winder treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. Alternating tread devices in accordance with Section 1009.13.
2. Ship ladders in accordance with Section 1009.14.
3. Spiral stairways in accordance with Section 1009.12.
4. ~~Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1028.11.2.~~ Stairways connecting aisle stairs to cross aisles or concourses shall be permitted to use the riser/tread dimension in Section 1028.11.1.
4~~5~~. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7 ¾ inches (197 mm); the

minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing projection not less than ¾ inch (19.1 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).

5~~6~~. See Section 3404.1 for the replacement of existing stairways.

6~~7~~. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

1009.7.4 (IFC [B] 1009.7.4) Dimensional uniformity. Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 3/8 inch (9.5 mm)in any flight of stairs. The greatest winder tread depth at the walk line within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Exceptions:

1. ~~Nonuniform riser dimensions of aisle stairs complying with Section 1028.11.2.~~ Stairways connecting aisle stairs to cross aisles or concourses shall be permitted to comply with the dimensional non-uniformity in Section 1028.11.2.
2. Consistently shaped winders, complying with Section 1009.7, differing from rectangular treads in the same stairway flight.

Where the bottom or top riser adjoins a sloping public way, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of stairway width. The nosings or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other nosing marking provided on the stair flight. The distinctive marking stripe shall be visible in descent of the stair and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

1009.8 (IFC [B] 1009.8) Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum width measured perpendicular to in the direction of travel equal to the width of the stairway. Where the stairway has a straight run the depth need not exceed 48 inches (1219 mm). Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exception: ~~Aisle stairs complying with Section 1028.~~ Where stairways connect aisle stairs to cross aisles or concourses, stairway landings are not required at the transition between stairways and aisle stairs constructed in accordance with Section 1028.

1009.10 (IFC [B] 1009.10) Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

~~1. Aisle stairs complying with Section 1028~~.

1.~~2.~~ Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.

2.~~3.~~ Spiral stairways used as a means of egress from technical production areas.

1009.15 (IFC [B] 1009.15) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

~~1.~~ ~~Handrails for aisle stairs provided in accordance with Section 1028.13.~~

1~~2.~~ Stairways within dwelling units, and spiral stairways are permitted to have a handrail on one side only.

2~~3.~~ Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.

3~~4.~~ In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.

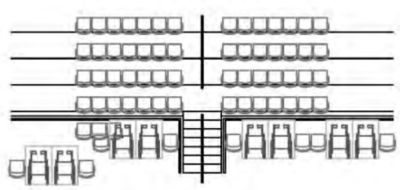
4~~5.~~ Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

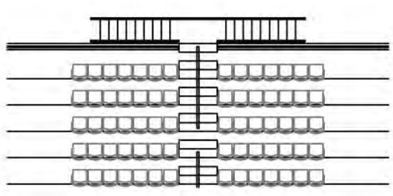
There are limited situations where aisle stairways transition directly to a stairway without first reaching a cross aisle or standard landing. Some examples are illustrated below. In these situations, to limit the chance of someone tripping at the transition, the specific exceptions for tread and riser dimensions (1009.7.2), dimensional uniformity (1009.7.4) and landings (1009.10) should be permitted in order to keep a consistent flight as occupants moved from aisle stair to stairway.

It is the intent of this code change to work in conjunction with the provisions to separate aisle stairs from stairways and ramped aisles from ramps in another proposal from this committee. BCAC has code changes in dealing with aisles in 1005, 1009, 1017 and 1028 as well as a transition between aisle stairs and stairways. The intent is for all four proposals to correlate; however this change can stand by itself.

C1

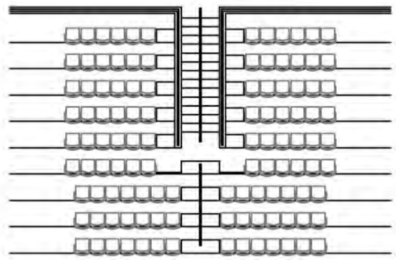


C1

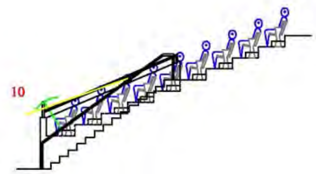


D1

D1



E2



E2

Cost Impact: This code change proposal will not increase the cost of construction.

E88-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.1#2-E-BAJNAI-BCAC.docx

E89 – 12
1009.3 (IFC [B] 1009.3)

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

1009.3 (IFC [B] 1009.3) Exit access stairways. Floor openings between stories created by exit access stairways shall be enclosed.

Exceptions:

1. In other than Group I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between, only two stories, are not required to be enclosed.
2. Exit access stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
3. In ~~buildings with only~~ Group B or M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
4. In other than Groups B and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
5. Exit access stairways within an atrium complying with the provisions of Section 404 are not required to be enclosed.
6. Exit access stairways and ramps in open parking garages that serve only the parking garage are not required to be enclosed.
7. Stairways serving outdoor facilities where all portions of the means of egress are essentially open to the outside are not required to be enclosed.
8. Exit access stairways serving stages, platforms and technical production areas in accordance with Sections 410.6.2 and 410.6.3 are not required to be enclosed.
9. Stairways are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.
10. In Group I-3 occupancies, exit access stairways constructed in accordance with Section 408.5 are not required to be enclosed.

Reason: We believe an inadvertent change to Section 1009.3 exception 3 was made by E5-09/10. In the 2009 IBC, Section 708.2 Exception 2.1 allowed this condition in Group B or M occupancies as proposed here. The language of the 2012 IBC is too restrictive. There are many buildings that include more than just a B or M occupancy. If the proper separation, areas, etc. are followed, this exception should be allowable for mixed use buildings, as this exception has qualifications that have to be met before this can be used. In addition, Exception #4 says: "In other than Group B and M occupancies …" **not** "In _buildings_ with other than…….." which seems to imply that this was the intent of Exception #3 too.

Cost Impact: The code change proposal will not increase the cost of construction.

E89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.3-E-Traxler.doc

E90 – 12
1009.3 (IFC [B] 1009.3)

Proponent: Robert J Davidson, Davidson Code Concepts LLC, representing self (rjd@davidsoncodeconcepts.com)

Revise as follows:

1009.3 (IFC [B] 1009.3) Exit access stairways. Floor openings between stories created by exit access stairways shall be enclosed.

Exceptions:

1. In other than Group I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between, only two stories, are not required to be enclosed.
2. Exit access stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
3. In buildings with only Group B or M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
~~4. In other than Groups B and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.~~
4~~5~~. Exit access stairways within an atrium complying with the provisions of Section 404 are not required to be enclosed.
5~~6~~. Exit access stairways and ramps in open parking garages that serve only the parking garage are not required to be enclosed.
6~~7~~. Stairways serving outdoor facilities where all portions of the means of egress are essentially open to the outside are not required to be enclosed.
7~~8~~. Exit access stairways serving stages, platforms and technical production areas in accordance with Sections 410.6.2 and 410.6.3 are not required to be enclosed.
8~~9~~. Stairways are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.
9~~10~~. In Group I-3 occupancies, exit access stairways constructed in accordance with Section 408.5 are not required to be enclosed.

Reason: The purpose of this code change is to delete the allowance for connecting up to four stories with an unenclosed exit access stairway. This language is the result of a re-write of code language last cycle that was purported to be editorial in nature. When I attempted to point out this change was expanding allowance of the connection of four stories in testimony at the final action hearings I was repeatedly interrupted by the supporters of the proposal and in their testimony they denied there was a change or increase in the allowance for interconnecting floor levels.

If you review the previous language found in the 2009 IBC at Section 708.2, Exception 2 you will find that this allowance did not permit a stairway **that was a portion of the means of egress** to be unenclosed under this concept. Since an "extra" stairway not need for, nor allowed to be considered a portion of the means of egress, would be an added cost that used up valuable square footage, this application of the code was rare. (That is if in fact it was done as provided for by the code and no credit for egress including travel distance was taken)

2009 International Building Code

708.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this section.

Exceptions:

2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or **stairway that is not a portion of the means of egress** protected according to Item 2.1 or 2.2.
   2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories .

With the revised language the code now allows unenclosed "exit access stairways" to connect up to four stories of a building. This is a major technical change; it allows the use of unenclosed stairways that ARE part of the means of egress. The purpose of adding the term "exit access stairway" to the code was to provide for recognition of the stairs for use in exit access provided the travel distance was measured. See 2012 IBC, Section 1016.3.1 below. So we find that the change was not just editorial, it was a significant reduction in safety provided from the spread of smoke or heat.

2012 International Building Code

1016.3.1 Exit access stairways and ramps. Travel distance on exit access stairways or ramps shall be included in the exit access travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings. The measurement along ramps shall be made on the walking surface in the center of the ramp and landings.

The problem with this section is not just a matter of increased allowances from one edition to another contrary to presentation. The section in question, 2012 IBC, Section 1009.3 Exception 4, is in direct conflict with the "atrium" provisions of Section 404.1 wherein additional fire protection features are required when we have an atrium, which is defined as an opening connecting two or more stories "other than enclosed stairways"… etc. Actually, if you apply the allowance for connecting floor levels with unenclosed stairs, you currently have an atrium by definition and design both in the older edition of the code and the present edition. Also note that there is no qualifier as to the size of an opening when dealing with atriums. It is just recognition that we have an opening that can allow the upward travel of smoke and heat due to the lack of an enclosing shaft.

SECTION 404
ATRIUMS

404.1 General. In other than Group H occupancies, and where permitted by Section 712.1.6, the provisions of Sections 404.1 through 404.9 shall apply to buildings or structures containing vertical openings defined as "Atriums."

ATRIUM. An opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.

Now objectors may argue that this is a matter of two different features, but a plain reading of the definition of an atrium and recognition of why we add fire protection features regardless of the size of the atrium clearly identifies that there is no difference. Whether I have a large atria with an open stairway in the middle, or a small atria with a stairway up through it does not change the fact that it is a path upward for smoke and heat. Since the atrium and the unenclosed exit access stairs present the same hazard, upward travel of smoke and heat, why such a major difference in the required fire protection features?

The new language is a major change from the last edition of the code, contrary to how it was presented to the committee and the membership, it allows a means of egress path where you might be traveling down into the smoke and/or heat, and it is in conflict with long recognized protection features for atriums, i.e, unenclosed holes in floor/ceiling assemblies,

Cost Impact: The code change proposal will increase the cost of construction.

E90-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.3-E-Davidson.doc

E91 – 12
1009.6, 1009.8, 1009.8.1-1009.8.5(New) [IFC [B] 1009.6, 1009.8, 1009.8.1-1009.8.5(New)]

Proponent: David W. Cooper, Stairway Manufacturing and Design Consultants representing Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

1009.6 (IFC [B] 1009.6) Walkline. The walkline across *winder* treads <u>and landings</u> shall be ~~concentric~~ <u>parallel</u> to the direction of travel <u>and concentric</u> through the turn. <u>The walkline shall be</u> ~~and~~ located 12 inches (305 mm) from the side where the *winders* are narrower<u> or from the side of shortest distance through the turn at a landing</u>. The 12-inch (305 mm) dimension shall be measured from the widest point of the clear ~~*stair*~~ width at the walking surface ~~of the *winder*~~. If *winders* are adjacent within the *flight*, the point of the widest clear *stair* width of the adjacent *winders* shall be used.

1009.8 (IFC [B] 1009.8) Stairway landings. There shall be a floor or landing at the top and bottom of each ~~*stairway*~~ <u>*flight of stairs*</u>. ~~The width of landings shall not be less than the width of *stairways* they serve. Every landing shall have a minimum width measured perpendicular to the direction of travel equal to the width of the *stairway*. Where the *stairway* has a straight run the depth need not exceed 48 inches (1219 mm). Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When *wheelchair spaces* are required on the *stairway* landing in accordance with Section 1007.6.1, the *wheelchair space* shall not be located in the required width of the landing and doors shall not swing over the *wheelchair spaces*.~~

Exception: *Aisle stairs* complying with Section 1028.

<u>**1009.8.1 (IFC [B] 1009.8.1) Stairway landing width.** The minimum width of landings shall be not less than the required width of the stairway. Every landing shall have a width at the top and bottom of each flight no less than the width of the *flight* at the junction with the landing. The minimum width of a landing at any point shall be not less than the width of the narrowest flight served as measured perpendicular to the walkline.</u>

<u>**1009.8.2 (IFC [B] 1009.8.2) Stairway landing depth.** At landings of straight run stairways and at stairway landing turns of 90 degrees or less between adjoining flights, the minimum landing depth shall be not less than the smaller of the minimum landing width or the value from Table 1009.8.2. Landings shall be measured between the vertical planes of the foremost projection of the tread and landing nosings at the intersections with the walkline.</u>

Table 1009.8.2 (IFC [B] Table 1009.8.2)
Landing Depth

Range of stairway turn at landing (degrees)		Minimum Landing Depth	
Greater than	**Less than or Equal to**	**Stairways other than spiral stairways and stairways within dwelling units and sleeping units (inches)**	**Spiral stairways and stairways within dwelling units and sleeping units (inches)**
85	90	21	18
80	85	23	19
75	80	24	20
70	75	26	21
65	70	27	22
60	65	29	23
55	60	30	24
50	55	32	25
45	50	33	26
40	45	35	27
35	40	36	28
30	35	38	29
25	30	39	30
20	25	41	31
15	20	42	32
10	15	44	33
5	10	45	34
0	5	47	35
0	0	48	36

For SI: 1 inch = 25.4 mm

1009.8.3 (IFC [B] 1009.8.3) Stairway landing shape. Walls and guards at the sides of landings shall be permitted to be curved or segmented.

1009.8.4 (IFC [B] 1009.8.4) Obstructions at stairway landings. The required width and depth of landings shall be unobstructed.

Exception: Encroachments complying with Section 1005.7.

1009.8.5 (IFC [B] 1009.8.5) Wheelchair spaces at stairway landings. Where *wheelchair spaces* are located on the *stairway* landing in accordance with Section 1007.6.1, the *wheelchair space* shall not be located in the required width or depth of the landing and doors shall not swing over the *wheelchair spaces*.

Reason: The intent of this proposal is to clarify stairway landing requirements. These provisions are not intended to be applicable to the unique configurations required within assembly seating areas. Those are addressed in Section 1028.

This proposal separates the component requirements of this section, allows a more precise understanding needed for both design and enforcement of required width and depth and provides a needed minimum landing depth requirement. In addition it provides a new requirement for landing shape that has previously been left to interpretation with needed explanation only offered within the code commentaries.

Landing Width: It is not uncommon that the widths of the flights vary within a stairway and the widths of different stairways sharing the same landing at a common floor level also vary. In fact different stairway widths may be required as passenger loads increase in the direction of egress. The current language is ambiguous as it does not clearly state what “The” width is when there is more than one stairway width or flight width at a landing.

Landing Depth is as critical as tread depth: Just as critical to good stairway design as tread depth is the depth of the landing. Landings should be designed to allow enough space to turn. Likewise and as the turning diminishes the landing should be of sufficient depth to prevent over stepping. Currently the code confuses landing depth as an element of its width without a specific depth requirement. The only specific reference to landing depth within this section serves to establish a “need not exceed dimension” of 48 inches (36 inches residential) for stairways with a straight run. Landing depth is especially critical at stairway landings that turn less than 90 degrees. Landing turns that are greater than 90 degrees are not addressed in this proposal because sufficient landing depth is provided by nature of the geometry. The intent of this proposal is not to increase the depth required at landings by the most common interpretations of the current code but to provide a clear application of the concept of landing depth at the walkline as experienced by the user. This proposal clarifies the current rectilinear requirements and provides a design solution that works regardless of the shape of the landing.

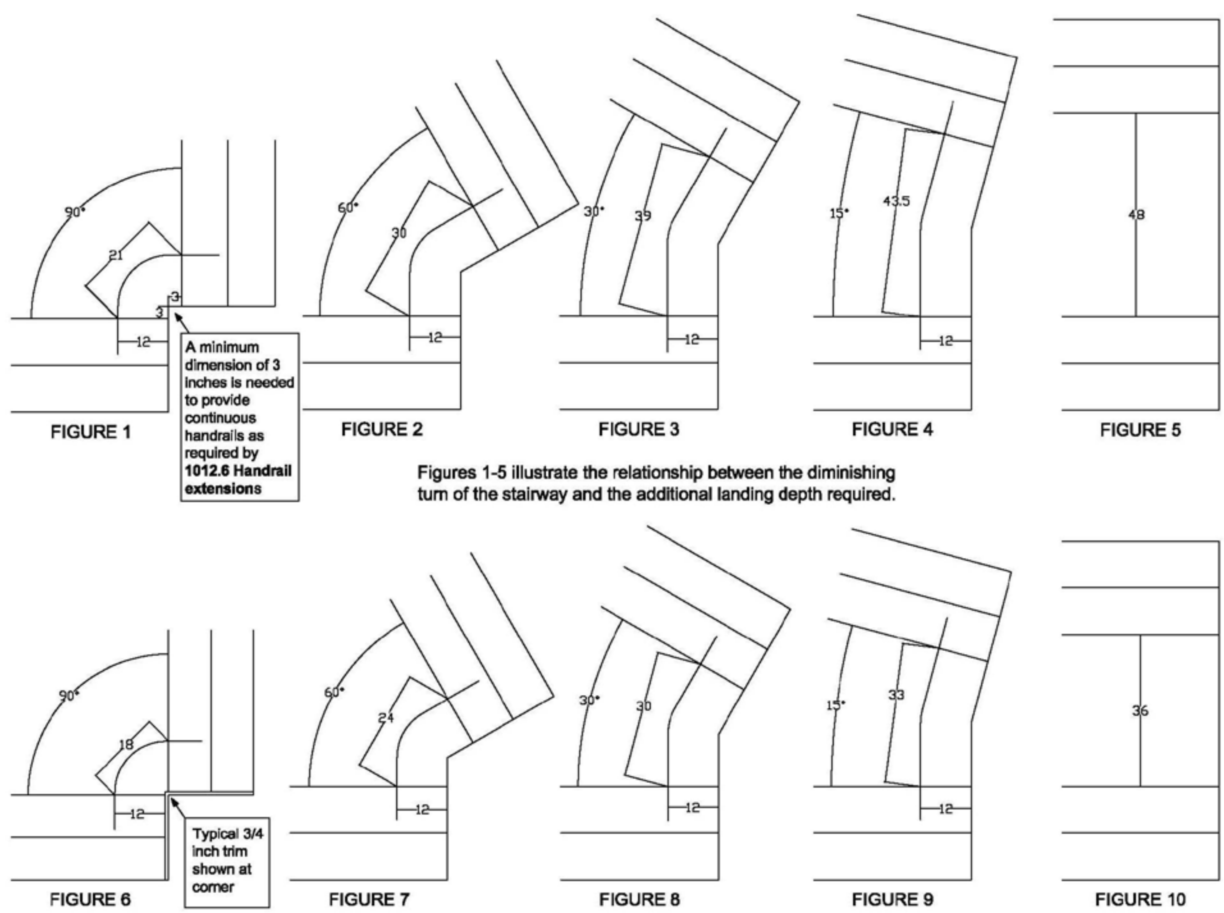
The Walkline can be used to regulate landing Depth: In order to regulate landing depth at the walkline, 1009.6 *Walkline*, has been modified to include landings. The modification recognizes that the walkline has both straight elements that are parallel and curved elements that are concentric and relates the walkline to both winders and landings. The walkline is referenced in a new landing depth section and a relationship is provided for controlling the depth of a landing where flights meet. The measuring criteria for landing depth is congruous with the criteria for measuring tread depth as found in 1009.7.2 *Riser height and tread depth*.

As illustrated in Figures 1 - 10 this proposal requires the landing depth increase as the angle of the turn diminishes to prevent overstepping of the landing and allow the space required to negotiate the turn. This correlates with the 48 inch “need not to exceed” depth of landings specified for stairways with straight runs currently in the code. Figure 1 and 6 shows a minimal 90 degree landing as built in accordance with the code. The landing in figure 1 has the minimum dimension necessary to provide for the continuous handrail connection as required in **1012.6 *Handrail extensions***. The minimum landing currently possible has a depth at the walkline as shown of 21 inches and is the minimum allowed by this proposal for a landing turn of 90 degrees. Since the code currently has a “need not exceed limit” of 48 inches applicable to the condition where the stairway is straight run a simple linear relationship between these two conditions allows for calculation of the data in **Table 1** increasing the landing depth by a constant increment as the turning decreases . Figures 2-5 clearly illustrate examples from the table.

Figure 6 shows a typical residential landing and figures 7-10 again illustrate examples from the table and the incremental increase needed for both spiral stairways and residential applications.

It should be noted that this proposal further provides a viable landing depth whether or not the adjoining flights are curved as it is related to the degree of turning only at the landing of the stairway.

Landing depth required at connecting flights as regulated at the walkline



Figures 1-5 illustrate the relationship between the diminishing turn of the stairway and the additional landing depth required.

Figures 6-10 illustrate the landing depth for spiral and residential stairways .

Minimum Landing Depth: If the landing depth, determined from the table, exceeds the minimum stairway width then the minimum stairway width shall be the minimum landing depth. If the stairway width exceeds the landing depth from the table then the landing depth from the table is the minimum landing depth.

Spiral stairways and stairways with in dwelling units: Figures 5-10 illustrate the landing conditions for stairways within dwelling units and spiral stairways and coordinates closely with the 2012 IRC. It allows a smaller 90 degree value of 18 inches where section **1012.6 *Handrail Extensions*** does not apply and correlates the incremental increase in depth with the minimum depth of 36 inches for residential stairways with a straight run. Particularly in residential applications this proposal helps to define the difference between a landing and a winder.

Landing Shape: The shape of landings is not regulated in the code and is sometimes interpreted to permit only rectangular shapes. Clearly landings take different shapes dependent upon the angle at which flights meet. The unused outside corner of landings that is beyond the width measured perpendicular to the direction of travel is not needed for egress. Although this is explained in the ICC commentaries this proposal incorporates a new section titled landing shape to provide for consistent interpretation and enforcement.

Doors and Wheelchair Space at Landings: The language for obstructions has been updated to reference 1005.7. The requirements are the same, but the new language would be consistent with text in aisle, corridors and exit passageways. The language for wheelchair spaces is existing.

Cost Impact: This will not affect the cost of construction.

E91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.6-E-Coooper.doc

E92 – 12
1009.7.4 (IFC [B] 1009.7.4)

Proponent: David W. Cooper , Stairway Manufacturing and Design Consultants representing Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

1009.7.4 (IFC [B] 1009.7.4) Dimensional uniformity. *Stair* treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 3/8 inch (9.5 mm) in any *flight* of *stairs*. The greatest *winder* tread depth at the walkline within any *flight* of *stairs* shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Exceptions:

1. Nonuniform riser dimensions of *aisle stairs* complying with Section 1028.11.2.
2. Consistently shaped *winders*, complying with Section 1009.7, differing from rectangular treads in the same *stairway flight*.
3. <u>Nonuniform riser dimension complying with Section 1009.7.4.1.</u>

<u>**1009.7.4.1 (IFC [B] 1009.7.4.1)**</u> <u>**Nonuniform height risers.**</u> Where the bottom or top riser adjoins a sloping *public way*, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of *stairway* width. The *nosings* or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other *nosing* marking provided on the *stair flight*. The distinctive marking stripe shall be visible in descent of the *stair* and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

Reason: Editorial

Cost Impact: This will not affect the cost of construction

E92-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.7.4-E-Cooper.doc

E93 – 12
1009.7.5 (IFC [B] 1009.7.5)

Proponent: David W. Cooper, Stairway Manufacturing and Design Consultants representing Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

1009.7.5 (IFC [B] 1009.7.5) Nosing and riser profile. ~~The radius of curvature at the leading edge of the tread shall be not greater than 9/16 inch (14.3 mm). Beveling of *nosings*~~ <u>*Nosings*</u> shall <u>have a curvature or bevel of not less than 1/8 inch (3.2 mm) but not more than</u> 9/16 inch (14.3 mm) <u>from the foremost projection of the tread</u>. Risers shall be solid and vertical or sloped under the tread above from the underside of the *nosing* above at an angle not more than 30 degrees (0.52 rad) from the vertical.

Reason: The radius of curvature is not of consequence as a smaller segment of a larger radius can be and is often used as shown in figure 2. The critical factor is to maximize the flat portion of the tread for purchase of the foot in descent.

A curvature or bevel at the nosing makes stairs safer; the nosing is less likely to chip or split due to use and wear, the nosing is not sharp and can reduce injury in a fall, and the change in the surface planes allows for light modeling that provides contrast resulting in improved visibility of the leading edge of the tread both in ascent and descent. For these reasons a minimum curvature or bevel has been added as a new requirement.

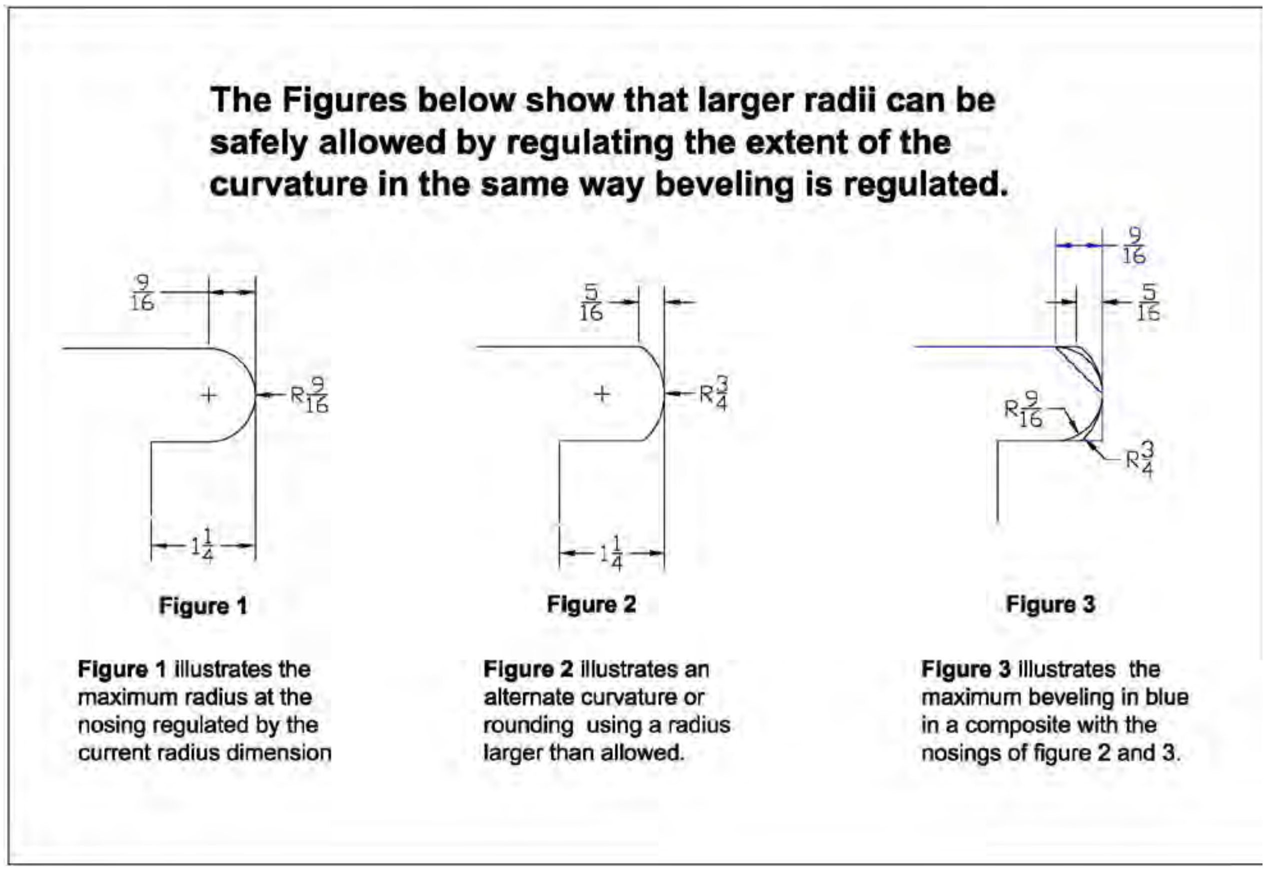


Figure 1 illustrates the maximum radius at the nosing regulated by the current radius dimension

Figure 2 illustrates an alternate curvature or rounding using a radius larger than allowed.

Figure 3 illustrates the maximum beveling in blue in a composite with the nosings of figure 2 and 3.

Cost Impact: This will not affect the cost of construction

E93-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.7.5 #1-E-Cooper.doc

E94-12
1009.7.5.3 (IFC [B] 1009.7.5.3)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1009.7.5.3 (IFC [B] 1009.7.5.3) Solid Risers. Risers shall be solid.

Exceptions:

1. Solid risers are not required for *stairways* that serve as the means of egress from areas exempted from accessibility in accordance with Section 1103.2. ~~that are not required to comply with Section 1007.3~~, ~~provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).~~
2. Solid risers are not required within Type B or non-accessible dwelling or sleeping units.
3. Means of egress stairways shall be permitted to have openings between treads that do not permit the passage of a sphere with a diameter of 4 inches (102 mm).

~~2~~4. Solid risers are not required for occupancies in Group I-3 or in Group F, H and S occupancies other than areas accessible to the public. ~~There are no restrictions on the size of the opening in the riser.~~

~~3~~5. Solid risers are not required for *spiral stairways* constructed in accordance with Section 1009.12.

~~4~~6. Solid risers are not required for *alternating tread devices* constructed in accordance with Section 1009.13.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent of this proposal is coordination with ADA requirements for solid risers on stairways as well as provide for a more logical and consistent application of solid risers.

The 1991 ADA only scoped stairways that connected levels that did not have an accessible route. The 2010 ADA Standard scopes stairways that are part of a means of egress, not just stairways that are part of an accessible means of egress. Therefore, the current Section 1009.7.5.3, Exception 1 was not coordinated with either the 1991 or 2010 ADA stairway provisions.

If an area is not required to be accessible, the route to that space is also exempted from ADA requirements; therefore, means of egress stairways from these areas are not covered by ADA. IBC Section 1103.2 has similar exceptions for accessible areas. For example, 1103.2.7 exempts areas raised for purposes of life safety, fire safety or security. With the proposed revisions in Section 1009.7.5.3, exception 1, stairways serving these areas are not required to have solid risers.

The new exception 2 would allow open risers on stairways within dwelling units or sleeping units that were covered by ADA (i.e., Accessible units or Type A units). Open risers are a common with stairways that provide access to basements within a residence.

One of the reasons for providing closed risers is to limit the chance that a cane could catch between risers. The 4" maximum opening would limit this as well as meet the 4" opening limits currently in the code for child protection.

Current exception 2 (new exception 4) has the last sentence deleted. This text is not needed, plus it could lead code users to think that other exceptions had size limitations.

Cost Impact: None

E94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.7.5.3-E-BALDASSARRA-CTC.docx

E95 – 12
1009.7.5, 1009.7.5.3 (IFC [B] 1009.7.5, 1009.7.5.3)

Proponent: David W. Cooper / Stairway Manufacturing and Design Consultants / Representing: Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

~~1009.7.5.3 (IFC [B] 1009.7.5.3)~~ 1009.7.5 (IFC [B] 1009.7.5) Solid Risers. Risers shall be solid.

Exceptions:

1. Solid risers are not required for stairways that serve as the means of egress from areas exempted from accessibility in accordance with Section 1103.2. ~~are not required to comply with Section 1007.3,~~
2. Solid risers are not required within Type B or non-accessible dwelling or sleeping units provided that the openings between the lower adjacent tread, floor, or landing and the lower edge of the riser that do not permit the passage of a sphere with a diameter of 4 inches (102 mm).
3. Means of egress stairways shall be permitted to have openings between the lower adjacent tread, floor, or landing and the lower edge of the riser that do ~~provided that the opening between treads does~~ not permit the passage of a sphere with a diameter of 4 inches (102 mm).
4. ~~2~~4. Solid risers are not required for occupancies in Group I-3 or in Group F, H and S occupancies other than areas accessible to the public. ~~There are no restrictions on the size of the opening in the riser.~~
5. ~~3~~5. Solid risers are not required for *spiral stairways* constructed in accordance with Section 1009.12.
6. ~~4~~6. Solid risers are not required for *alternating tread devices* constructed in accordance with Section 1009.13.
7. Solid risers are not required for ship ladders constructed in accordance with Section 1009.14

~~1009.7.5~~ 1009.7.6 (IFC [B] ~~1009.7.5~~ 1009.7.6) Nosing and riser profile. The radius of curvature at the leading edge of the tread shall be not greater than 9/16 inch (14.3 mm). Beveling of *nosings* shall not exceed 9/16 inch (14.3 mm). Risers shall be ~~solid and~~ vertical or sloped under the tread above from the underside of the *nosing* above at an angle not more than 30 degrees (0.52 rad) from the vertical.

~~1009.7.5.1~~ 1009.7.6.1 (IFC [B] ~~1009.7.5.1~~ 1009.7.6.1) Nosing projection size. The leading edge (*nosings*) of treads shall project not more than 1 ¼ inches (32 mm) beyond the tread below.

~~1009.7.5.2~~ 1009.7.6.2 (IFC [B] ~~1009.7.5.2~~ 1009.7.6.2) Nosing projection uniformity. All *nosing* projections of the leading edges shall be of uniform size, including the projections of the *nosings* leading edge of the floor at the top of a *flight*.

(Renumber subsequent sections)

Reason: Section **1009.7.5 Nosing and riser profile** is a constant source of controversy and misunderstanding. The reference to solid risers does not belong in the section that describes the profile or outline of a step. Notably masked in exception 1 by double negatives is the requirement for the limitation of openings in risers.

This proposal clarifies the scoping for use of solid risers and coordinates with the new ADA guidelines as outlined by the CTC. **Solid risers**, as a new and separate section subsection of **1009.7 Treads and risers** will appear prior to Nosing and riser profile. This allows easier identification of the opening limitation between treads and adjoining floors or landings that was previously misunderstood or not found. Exceptions 2 and 3 are similar to the CTC's proposal but assures that an opening limitation applies to Type B units as well as egress stairs and also provides that if an opening is used in the riser, it is in the lower portion of the riser height, as shown in **Figure 1**, allowing design options that may provide additional heal clearance in descent and the appropriate design of tread nosings compliant with ADA guidelines that are important in ascent.

It is worth noting that the stairs covered in exception 2 would likely be means of egress stairs and would be covered by exception 3. If the committee wishes to modify this proposal by eliminating exception 2 in its entirety it would seem to work as well with less verbiage.

The out of place reference to solid risers has been eliminated from 1009.7.5 *Nosing and riser profile*. The profile of a stair nosing and riser are aptly described without the misplaced reference to the composition of risers. The content of the exceptions has been moved from 1009.7.5 *Nosing and riser profile* to the new section and coordinated with ADA guidelines.

Exception 7 adds ship ladders that were not previously included but should be as their use is made safer with the additional space for overhang of the toes in both ascent and in the typical backing down descent common to ladder use.

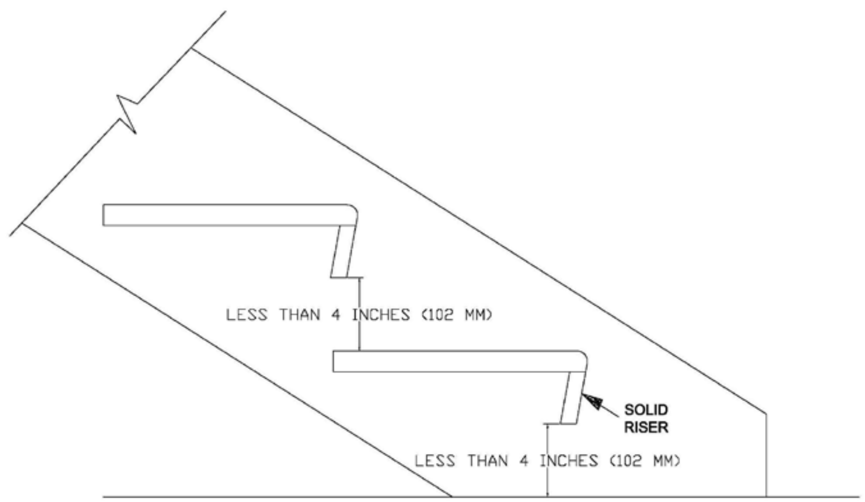


FIGURE 1

Cost Impact: This will not affect the cost of construction

E95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.7.5 #2-E-Cooper.doc

E96 – 12

NUMBER NOT USED

E96-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E97 – 12
1009.9.4 (IFC [B] 1009.9.4)

Proponent: Robert Trotter, representing Tennessee Code Development Committee (bobtrotter1023@aol.com)

Revise as follows:

1026.7 ~~1009.9.4~~ (IFC [B] 1026.7 ~~1009.9.4)~~ Enclosures under exterior stairways. There shall be no enclosed usable space under exterior exit stairways unless the space is completely enclosed in 1-hour fire-resistance-rated construction. The open space under exterior stairways shall not be used for any purpose.

Reason: The intent of this proposal is to shift the 1009.9.4 requirement to Section 1026 in order to make a more user-friendly Code. 1009.4 specifically refers to "exterior exit stairways" and should be located under 1026 Exterior Exit Stairways and Ramps.

Cost Impact: The code change proposal will not increase the cost of construction beyond previous requirement expectations.

E97-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1026.7-E-Trotter.doc

E98 – 12
1009.10 (IFC [B] 1009.10)

Proponent: David W. Cooper, Stairway Manufacturing and Design Consultants representing Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

~~1009.10~~1009.4 (IFC [B] ~~1009.10~~1009.4) ~~Vertical~~ Total rise. A *flight* of *stairs* shall not have a total vertical rise greater than ~~12 feet (3658 mm)~~ 147 inches (3734 mm) between floor levels or landings.

Exceptions:

1. *Aisle stairs* complying with Section 1028.
2. *Alternating tread devices* used as a *means of egress* shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. *Spiral stairways* used as a *means of egress* from *technical production areas*.

(Renumber subsequent sections)

Reason: This section has been renamed to use the term "Total rise" that is common to the industry however the adjective "vertical" remains within the requirement for clear definition by all. The use of industry terms has been substantiated throughout the code.

The elevation of 147 inches is a multiple of the maximum riser heights of, 7 inches (178 mm) commercial and 7-3/4 inches (197 mm) residential, allowed for IBC stairways. (See Table 1) This minor change of just 3 inches (76 mm) in the total rise of the flight would in many cases eliminate the cost of incorporating a landing and the space required, in many instances reducing costs of construction. As can be seen in the table below this change would require no additional steps in the stair than the current code requires and a change in riser height of just 5/32 inch (4 mm) or less when the minimum number of risers is desired. This represents no discernable difference consequential to the user.

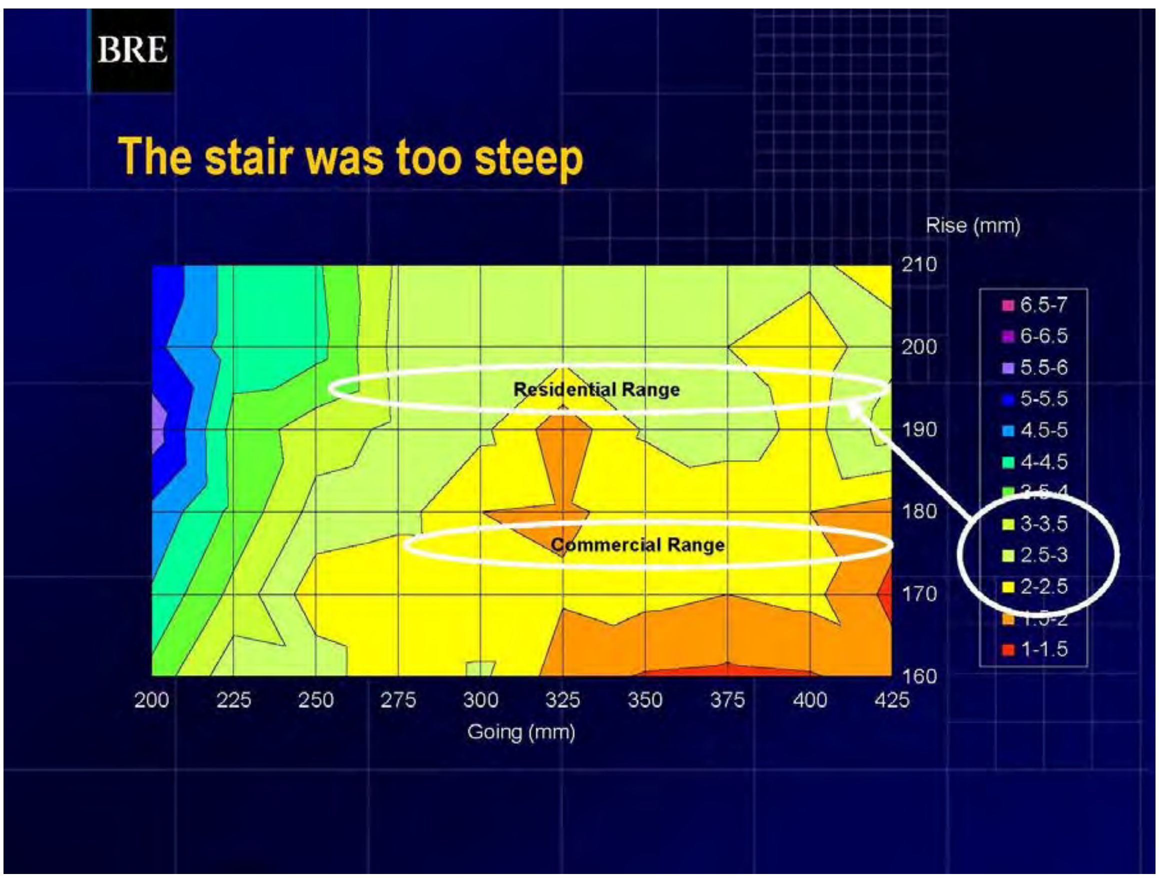


Figure 1 Residential Range = 7.58” (193mm) – 7.74” (197mm), Commercial Range = 6.84” (174mm) – 7” (178mm) see Table 1
Please note that the described circled ranges have been added to figures 1&2 by the proponent for the purpose of explanation.

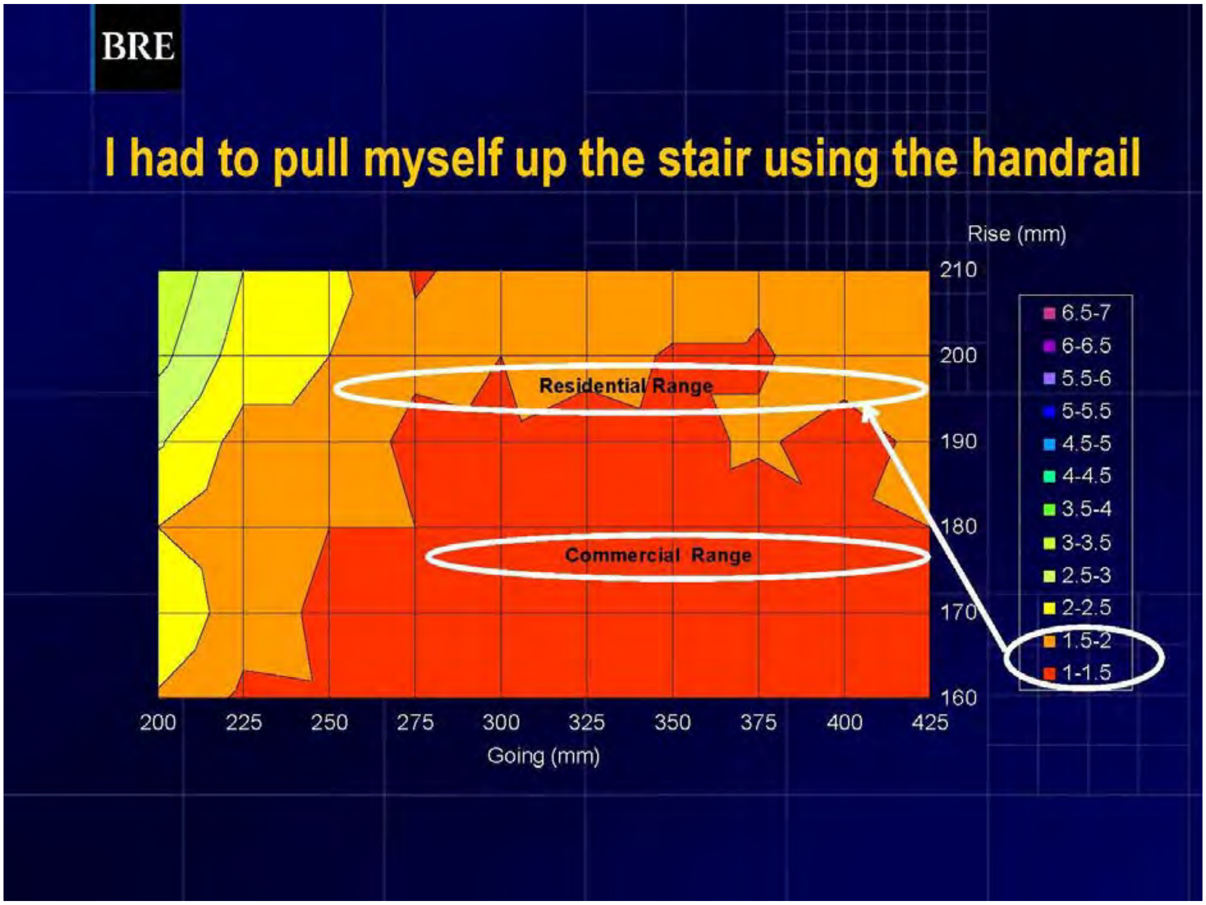


Figure 2 Residential Range = 7.58” (193mm) – 7.74” (197mm), Commercial Range = 6.84” (174mm) – 7” (178mm) see Table 1
Please note that the described circled ranges have been added to figures 1&2 by the proponent for the purpose of explanation.

	Vertical Rise	# Risers	Riser Height Inches	Change in Riser Height inches	Riser Height mm	Change in Riser Height mm
Most Occupancies	144	21	6.86		174	
	147	21	7.00	0.14	178	4
Dwelling Units	144	19	7.58		193	
	147	19	7.74	0.16	197	4

Table 1

Testing in support of this proposal, as shown in the data presentations (Figure 1 and 2) from; “The Influence of Rise and Going Combinations on Stair Safety” by M S Roys, June 2004, 7th World Conference on Injury Prevention and Safety Promotion, Vienna[1], the minor variation in rise does not produce any consequential effect that can be noticed by users when comparing riser heights within the range in question. *Please note that the circled ranges have been added to figure 1 & 2 by the proponent for the purpose of explanation*. Figures one and two can be related to the perceived energy required in ascent as described by the subjective rating of the steepness of the stair and the need to pull oneself up the stair using the handrail. In these figures the user’s ratings are on a scale of 1-7 and color coded. The visual display of the data shows little difference in the users ratings over the range in question.

Additional testing data from this same study further illustrates little difference in the user's perception of riser height. When asked to rate descent of the stairway in response to the statement "I felt safe when walking down the stair" the risers heights of 6.69 inches, 7.09 inches, 7.48 inches (170 mm, 180 mm, 190 mm) all were rated the same with a tread depth of 10.83 inches (275 mm). Compared with the same tread depth the riser heights of 7.87 inches, 6.30 inches (200 mm, 160 mm) were within approximately 0.5 points on a scale of 7 points further indicating little difference being perceived by the users. This provides further validation that the change proposed is reasonable and will not affect stair safety.

Relocation of Section – Vertical Rise is the first consideration and arguably most significant factor in determining the design of a stairway. It is of consequence to the number of treads and landings affecting width, headroom, and step geometry. This section is buried in the code and the fact that it is overlooked is of consequence. This proposal moves the section to head the stairway geometry requirements to assimilate the sequence of use in design.

Construction cost reduction – It is common for the total rise to exceed 144 inches (3658 mm) with oversight of the requirement or minor changes in floor systems and finish flooring options. This requires the addition of an intermediate landing. Adding a landing increases the footprint of the stairway and the cost if the space is available.

Understanding and Compliance – This change will not increase the number of risers needed in the stairway or make the stairway less safe, or add any significantly perceived increase in energy to climb the stairway. This needed change provides a direct relationship between the vertical rise requirement and the requirements for riser height that would assure better understanding and compliance.

Bibliography:
1. "The influence of rise and going combinations on stair safety"; M.S. Roys, 7th World Conference on Injury Prevention and Safety Promotion, Vienna, June 2004

Cost Impact: This will reduce the cost of construction.

E98-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.10-E-Cooper.doc

E99 – 12
1009.11 (IFC [B] 1009.11)

Proponent: David W. Cooper, Stairway Manufacturing and Design Consultants representing Stairway Manufacturers’ Association (sma@stairways.org)

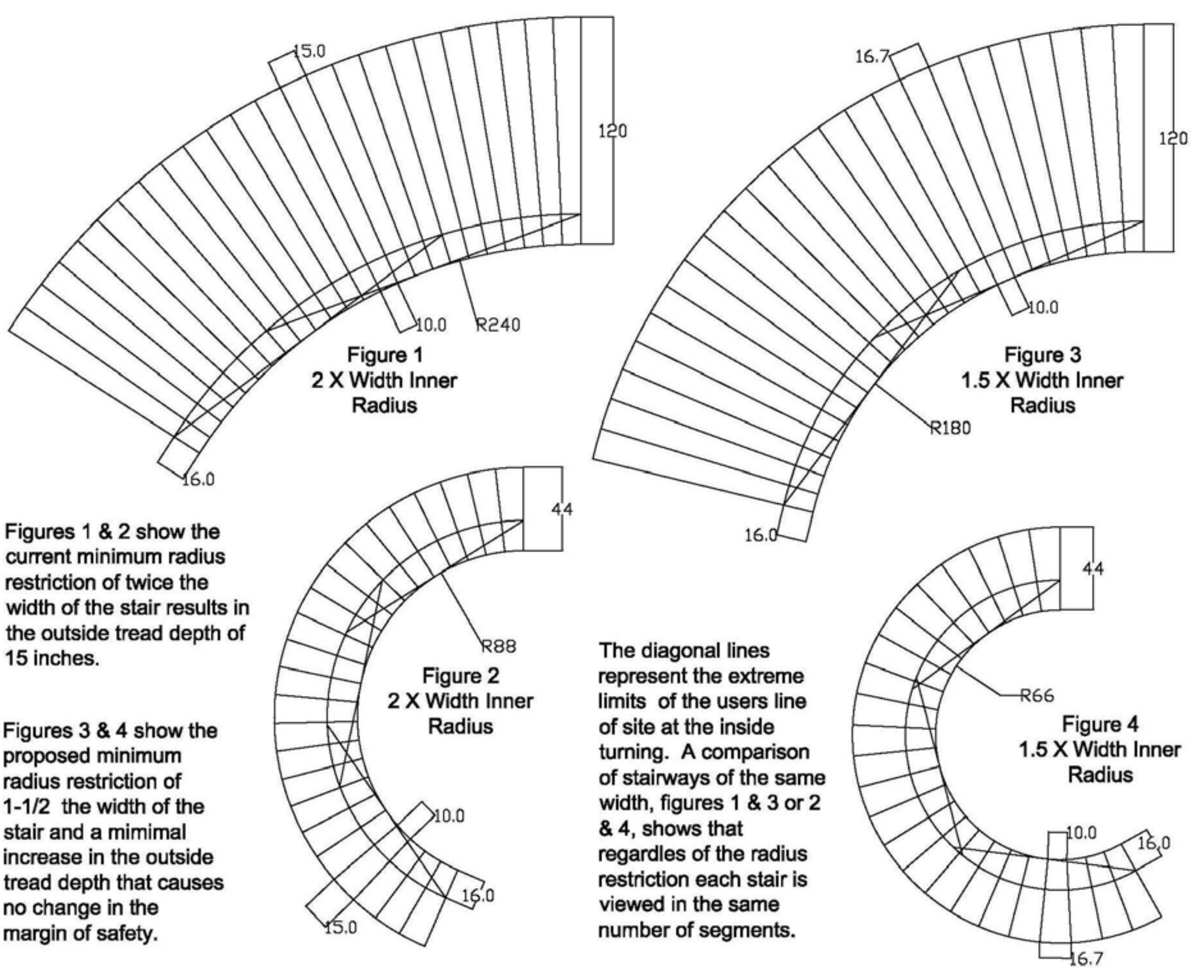
Revise as follows:

1009.11 (IFC [B] 1009.11) Curved stairways. Curved *stairways* with *winder* treads shall have treads and risers in accordance with Section 1009.7 and the smallest radius shall not be less than ~~twice~~ 1.5 times the required width of the *stairway*.

Exception: The radius restriction shall not apply to curved *stairways* for occupancies in Group R-3 and within individual *dwelling units* in occupancies in Group R-2.

Reason: The current radius restriction of twice the radius has little basis other than a rule of thumb handed down from the legacy codes and causes unnecessary restriction of curved stairway design without enhancing the safety of the user. Reducing the smallest radius restriction to 1.5 times the width is a more reasonable standard that will allow greater freedom of design. See **Figures 1 - 4** illustrating that only a slight increase in tread depth of less than 1¾ inches is realized at the outside radius and that the additional turning of the stairway does not substantially affect the view of other users that would be proximal on the stairway.

The examples below illustrate that a reduction in the minimum radius restriction will not affect the safe use of curved stairways due to tread depth or the turning of the stairway.



The dimension used for the line of sight indicated by the diagonal lines drawn across the stairs is sixteen inches accommodating the required handrail and the proximal position of the stairway passenger. The position is based on the most common lateral displacement of 350 mm (13.8 inches)[1] from the center of the handrail to the center of the body for the handrail slope of 33º that is common to IBC compliant stairways. Added to this is half the allowed handrail width of 2¼ inches and the minimum clearance of 1½ inches totaling 16.4 inches.

The inconsequence of the minor increase in tread depth width is substantiated by testing performed by Mike Roys[2] as shown in **Figure 5**. Both the 15 inch (381 mm) and 16.7 inch (424 mm) tread depths lie in the same range of preference as indicated within the red circle. *The circle was added by the proponent for the purpose of explanation*.

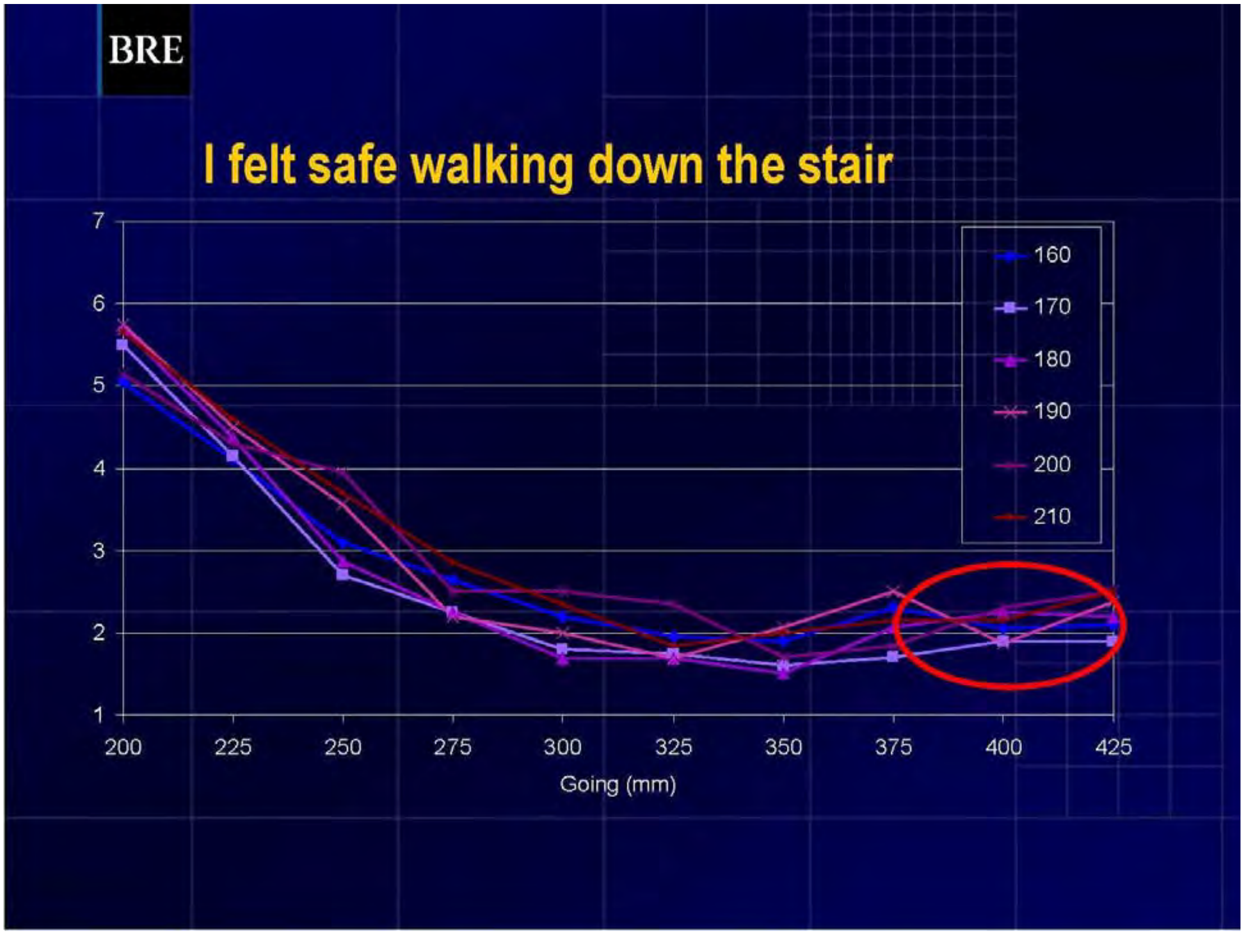


Figure 5

Bibliography

1. "Biomechanical Assessment of Handrail Parameters With Special Consideration to the Needs of Elderly Users"; B.E. Maki, et al, West Park Research, May 5, 1983
2. "The influence of rise and going combinations on stair safety"; M.S. Roys, 7th World Conference on Injury Prevention and Safety Promotion, Vienna, June 2004

Cost Impact: This will not affect the cost of construction.

E99-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.11-E-Cooper.doc

E100 – 12
1009.1, 1009.13, 1009.14 (IFC [B] 1009.1, 1009.13, 1009.14)

Proponent: David W. Cooper, Stairway Manufacturing and Design Consultants representing Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

1009.1 (IFC [B] 1009.1) General. *Stairways*<u>, *alternating tread devices,*</u> and <u>*ship ladders*</u> serving occupied portions of a building shall comply with the requirements of this section.

1009.13 (IFC [B] 1009.13) Alternating tread devices. *Alternating tread devices* are limited to an element of a *means of egress* in buildings of Groups F, H and S from a mezzanine not more than 250 square feet ($23\ m^2$) in area and which serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet ($23\ m^2$) in area and for access to unoccupied roofs.

<u>*Alternating tread devices* are permitted within dwelling units of Group R-3 and Group R-2 where they do not serve as an element of the required means of egress.</u>

1009.13.1 (IFC [B] 1009.13.1) Handrails of alternating tread devices. *(no change)*

1009.13.2 (IFC [B] 1009.13.2) Treads of alternating tread devices. *(no change)*

1009.14 (IFC [B] 1009.14) Ship ladders. Ship ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet ($23\ m^2$) with not more than three occupants and for access to unoccupied roofs.

<u>*Ship ladders* are permitted within dwelling units of Group R-3 and Group R-2 where they do not serve as an element of the required means of egress.</u>

Ship ladders shall have a minimum tread depth of 5 inches (127 mm). The tread shall be projected such that the total of the tread depth plus the *nosing* projection is no less than $8^1/_2$ inches (216 mm). The maximum riser height shall be $9^1/_2$ inches (241 mm)

.

Handrails shall be provided on both sides of ship ladders. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm).

Reason: Alternating tread devices and Ship ladders by name, definition, and requirements are unique and should be listed in the charging paragraph separate from stairways.

Alternating tread devices and Ship ladders can and are being used in dwellings because they meet a practical purpose to access smaller areas. The code should regulate design and construction in such uses. Prior proposals to incorporate these devices and ship ladders have failed because they have proposed their use as a means of egress. The limited use prescribed by this proposal would provide needed guidance as to their applicability, design and use without changing current egress requirements.

Cost Impact: This will not affect the cost of construction.

E100-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.1-E-Coooper.doc

E101 – 12

505.3, 1009.10, 1009.14, 1009.16, 1009.16.1 (IFC [B] 1009.10, 1009.14, 1009.16, 1009.16.1)

Proponent: Jeff Sprout, AIA, Target, representing Target Corporation (jeff.sprout@target.com)

Revise as follows:

505.3 Equipment platforms. *Equipment platforms* in buildings shall not be considered as a portion of the floor below. Such *equipment platforms* shall not contribute to either the *building area* or the number of *stories* as regulated by Section 503.1. The area of the *equipment platform* shall not be included in determining the *fire area* in accordance with Section 903. *Equipment platforms* shall not be a part of any *mezzanine* and such platforms and the walkways, *stairs*, *alternating tread devices*, ships ladders and ladders providing access to an *equipment platform* shall not serve as a part of the *means of egress* from the building.

Revise as follows:

1009.10 (IFC [B] 1009.10) Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

1. Aisle stairs complying with Section 1028.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. Spiral stairways used as a means of egress from technical production areas.
4. Ships ladders shall not have a vertical rise greater than 18 feet (5.5 m) between floor levels or landings.

1009.14 (IFC [B] 1009.14) Ships Ladders. Ship ladders are permitted to be used in Group I-3 as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than 3 occupants and for access to unoccupied roofs. Ship ladders are permitted to be used for access to mechanical equipment or appliances requiring periodic inspection, service, or maintenance that are installed on roofs or elevated equipment platforms.

Exception: Ships ladders are not required where portable ladders are permitted in accordance with the Section 306.5 of the International Mechanical Code.

1009.14.1 (IFC [B] 1009.14.1) Configurations. Ships ladders shall be constructed in accordance with the following:

1. The ship ladder shall be installed at an angle of not less than 50 degrees and not more than 70 degrees measured from the horizontal plane.
2. Ship ladders shall have a minimum tread depth of ~~5~~ 6 inches (~~127~~ 152 mm).~~The tread shall be projected such that the total of the tread depth plus the nosing projection is no less than 8.5 inches (216 mm).~~
3. The risers shall be equally spaces with a riser height not less than 8 ½ inches (267 mm) and not more than ~~maximum riser height shall be~~ ~~9 ½~~ 12 inches (~~241~~ 356 mm).
4. Continuous handrails shall be provided on both sides of ship ladders.
5. The minimum clear width at and below the handrails shall be ~~20~~ 18 inches (~~508~~ 457 mm).

1009.16 (IFC [B] 1009.16) Stairway to roof. In buildings four or more stories above *grade plane*, one *stairway* shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings without an occupied roof, access to the roof from the top story shall be permitted to be by an *alternating tread device* or ships ladders.

1009.16.1 (IFC [B] 1009.16.1) Roof access. Where a *stairway* is provided to a roof, access to the roof shall be provided through a *penthouse* complying with Section 1509.2.

Exception: In buildings without an occupied roof, access to the roof shall be permitted to be a roof hatch or trap door in accordance not less than 8 ~~16~~ square feet (0.75 ~~1.5~~ m^2) in area and having a minimum dimension of 20 inches ~~2 feet~~ (508 ~~610~~ mm).

1009.16.2 (IFC [B] 1009.16.2) Protection at roof hatch openings. Where the roof hatch opening providing the required access is located within 10 feet (3049 mm) of the roof edge, such roof access or roof edge shall be protected by *guards* installed in accordance with the provisions of Section 1013.

1009.17 (IFC [B] 1009.17) Stairway to elevator equipment. Roofs and *penthouses* containing elevator equipment that must be accessed for maintenance are required to be accessed by a *stairway*.

Reason: The ship ladder follows or meets OSHA guidelines and can be safer to use than an alternating tread stair which requires the user to always start with the right foot and balance on one foot while attempting to open the roof hatch when at the top of the ladder.

Cost Impact: The code change proposal will not increase the cost of construction.

E101-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.14.1-E-Sprout.doc

E102– 12

1009.1, 1009.16, 1009.16.2, 1009.18 (New) [IFC [B] 1009.1, 1009.16, 1009.16.2, 1009.18 (New)]

Proponent: Ali M. Fattah, P.E., City of San Diego, representing the San Diego Area Chapter of ICC

Revise as follows:

1009.1 (IFC [B] 1009.1) General. *Stairways* serving occupied portions of a building shall comply with the requirements of ~~this section~~ Sections 1009.2 through 1009.15. Alternating tread devices shall comply with Section 1009.16. Ships ladders shall comply with Section 1009.17. Ladders shall comply with Section 1009.18.

~~1009.15~~ 1009.13 (IFC [B] ~~1009.15~~ 1009.13) Handrails. *(no change)*

~~1009.16~~ 1009.14 (IFC [B] ~~1009.16~~ 1009.14) Stairway to roof. In buildings four or more stories above grade plane, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope).

> **Exception:** Other than where required by Section 1009.14.1, in buildings without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device, a ships ladder or a permanent ladder.

~~1009.17~~ 1009.14.1 (IFC [B] ~~1009.17~~ 1009.14.1) Stairway to elevator equipment. Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a stairway.

~~1009.16.1~~ 1009.14.2 (IFC [B] ~~1009.16.1~~ 1009.14.2) Roof access. Where a stairway is provided to a roof, access to the roof shall be provided through a penthouse complying with Section 1509.2.

> **Exception:** In buildings without an occupied roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet (1.5 m2) in area and having a minimum dimension of 2 feet (610 mm).

1009.15 ~~1009.16.2~~ (IFC [B] 1009.15 ~~1009.16.2~~) ~~Protection at roof hatch openings.~~ Guards. Guards shall be provided along stairways and landing where required by Section 1013 and shall be constructed in accordance with Section 1013. Where the roof hatch opening providing the required access is located within 10 feet (3049 mm) of the roof edge, such roof access or roof edge shall be protected by guards installed in accordance with the provisions of Section 1013.

~~1009.13~~ 1009.16 (IFC [B] ~~1009.13~~ 1009.16) Alternating tread devices. *(No change to current text)*

~~1009.13.1~~ 1009.16.1 (IFC [B] ~~1009.13.1~~ 1009.16.1) Handrails of alternating tread devices. *(No change to current text)*

~~1009.13.2~~ 1009.16.2 (IFC [B] ~~1009.13.2~~ 1009.16.2) Treads of alternating tread devices. *(No change to current text)*

~~1009.14~~ 1009.17 (IFC [B] ~~1009.14~~ 1009.17) Ships Ladders. *(No change to current text)*

1009.18 (IFC [B] 1009.18) Ladders. Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a the building. Permanent ladders shall be permitted to providing access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment;

2. <u>Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways;</u>
3. <u>Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands;</u>
4. <u>Elevated levels in Group U not open to the general public;</u>
5. <u>Non-occupied roofs that are not required to have stairway access in accordance with Section 1009.14.1.</u>
6. <u>Ladders shall be constructed in accordance with Section 306.5 of the International Mechanical Code, Sections 306.5.</u>

Reason: The IBC is not clear on whether means of egress is required from certain spaces such as catwalks above ceilings, mechanical equipment areas, service pits etc. that are occasionally accessed or that are accessed by able bodied trained personnel. Furthermore the IBC makes no mention that certain areas may be accessed with fixed ladders as permitted by other codes within the I code family of codes. The means of egress definition implies that chapter 10 applies to occupied spaces. Occupied space is not defined however occupiable space does and does not exclude elevated areas used for security and observation persons required to be able bodied. The proposed reformatting of Section 1009 includes ladders as a restricted element for vertical travel in addition to ships ladders and alternating tread devices. Alternating tread devices and ships ladders are permitted as a means of egress subject to limitations.

Section 1009.18 is added to delineate when ladders can access certain areas not considered to be occupied and therefore do not need to be served by means of egress. Condition 1 frequently occurs in auto repair bays, areas in manufacturing facilities, elevator pits etc. Condition 3 addresses areas that are elevated for security personnel. Condition 4 addresses barns and stables and private garages where equipment or materials may be stored in an overhead area.

Permanent ladders are required from equipment service areas in accordance with the IMC. See text below. There are other locations where ladders are needed because there is no space for a stairway (i.e., elevator pits). While the ladder is not part of the required means of egress, a safe ladder should be provided when used for access to non-occupied spaces.

Part of this change is editorial to group all the stairway provisions together and then provide guidance for alternating tread devices, ships ladders and permanent ladders.

IMC 306.5 Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access or appliances are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center. The uppermost rung shall be a maximum of 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488.2 kg/m2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be a minimum of 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15-inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.
8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.
9. Ladders shall be protected against corrosion by *approved* means.
10. Access to ladders shall be provided at all times.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 occupancies.

IMC 306.5.1 Sloped roofs. Where appliances, *equipment*, fans or other components that require service are installed on a roof having a slope of three units vertical in 12 units horizontal (25-percent slope) or greater and having an edge more than 30 inches (762 mm) above grade at such edge, a level platform shall be provided on each side of the *appliance* or *equipment* to which access is required for service, repair or maintenance. The platform shall be not less than 30 inches (762 mm) in any dimension and shall be provided with guards. The guards shall extend not less than 42 inches (1067 mm) above the platform, shall be constructed so as to prevent the passage of a 21-inch diameter (533 mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code*. Access shall not require walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Where access involves obstructions greater than 30 inches (762 mm) in height, such obstructions shall be provided with ladders installed in accordance with Section 306.5 or stairs installed in accordance with the requirements specified in the *International Building Code* in the path of travel to and from appliances, fans or *equipment* requiring service.

Cost Impact: None.

E102-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.1-E-Fattah.doc

E103-12
1011.6.3 (IFC [B] 1011.6.3)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

1011.6.3 (IFC [B] 1011.6.3) Power source. *Exit* signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

Exception<u>s</u>:

1. <u>1.</u> *Approved exit* sign illumination means that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.
2. <u>2. Group I-2 hospital exit sign illumination shall not be provided by unit equipment battery only.</u>

Reason: The IBC and IFC both have the same requirements. NFPA is less restrictive for UL listings of equipment. NFPA 70 is not referenced by IBC/IFC as does NFPA 99. IBC/IFC permit batteries.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

E103-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1017.3-E-WILLIAMS-ADHOC.doc

E104 – 12
1012.8 (IFC [B] 1012.8)

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing self (geneb@codeconsultants.com)

Revise as follows:

1012.8 (IFC [B] 1012.8) Projections. On ramps, the clear width between handrails shall be 36 inches (914 mm) minimum. Projections into the required width of stairways and ramps at each side shall not exceed 41/2 inches (114 mm) at or below the handrail height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1009.5. Projections due to intermediate handrails shall not constitute a reduction in the egress width provided that each intermediate handrail is not wider than 2-1/4 inches (57 mm).

Reason: The intent, when this provision was originally added, was to allow intermediate handrails to not count against the required width since it was required on wide stairs and provided added safety on ramps. Because the prior code text was unclear what effect a handrail had on the allowed projections into the stair or ramp and what that did for the overall capacity of the egress element some change was necessary. When a person moves on a stair or ramp, using the handrail, the arm is over the railing. The person on the other side of the railing does likewise. This type of condition does not effectively reduce the capacity of the egress element and increases safety by virtue of the handrail itself.

However, double railings widen the space between columns of people on ramps and stairs and can reduce capacity. A set of handrails separated by 10 inches may be helpful in providing each column with a handrail but it should be taken into consideration when calculating the capacity of the ramp or stair. The proposal uses a 2-1/4 inch dimension to allow for non-circular handrails which might meet the requirements of Section 1012.3.1 for Type I handrails. Thus, if a single railing (or multiple single railings) is placed within a stair or ramp, each railing, if less than 2-1/4 inches in width, would not count to decrease the capacity of the egress element or required width.

However, if a set of double railings would be provided within the stair or ramp, the minimum overall width of a double railing would be 4 inches (two 1-1/4 inch railings, plus 1-1/2 inch clear between railings per Section 1012.3.1 and 1012.7). This would need to be deducted from the total width of the stair or ramp.

Cost Impact: The code change proposal will not increase the cost of construction.

E104-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1012.8-E-Boecker.doc

105 – 12
1013.2 (IFC [B] 1013.2)

Proponent: Richard Broome, CBO, City of Birmingham, AL representing self (richard.broome@birminghamal.gov)

Revise as follows:

1013.2 (IFC [B] 1013.2) Where required. *Guards* shall be located along open-sided walking surfaces), including *mezzanines, equipment platforms, stairs, ramps* and landings that are located more than ~~30~~ 21 inches (~~762~~ 533 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.7.

Exception: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where *guards* in accordance with Section 1028.14 are permitted and provided.

Reason: I believe that the 30" height is way too high. Code 1009.12 #5 states "Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require *handrails.*" That would be 21 inches on a 7:11 format. If handrails are required above three risers (21 inches) so should guards.

Cost Impact: There would be a slight cost increase; but not excessive. Relative to the total cost and dependant on the size of landing or deck, the added safety margin should more than outweigh the additional cost.

E105-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1013.1-E-Broome.doc

E106 – 12
1013.3 (IFC [B] 1013.3)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1013.3 (IFC [B] 1013.3) Height. Required guards shall not be less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces,
2. On the line connecting the leading edges of the tread nosings, and
3. On ramps from the ramp surface at the guard.
4. <u>From a seatboard where a guard would be required at the walking surface and the seatboard is part of the guard or adjacent to the guard.</u>

Exceptions:

1. <u>For one- and two- family dwellings and townhouses in Group R-2 and R-3,</u> ~~For occupancies in Group R-3 not more than three stories above grade in height and~~ <u>required guards</u> within individual dwelling units <u>and in areas serving</u> <u>the dwelling unit</u> ~~in occupancies in Group R-2 not more than three stories above grade in height with separate means of egress,~~ ~~required guards~~ shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces or ~~fixed seating~~ <u>seatboard</u>.
2. <u>For Group R-2 and R-3 units, required guards within the dwelling unit shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surface or seatboard.</u>
3. <u>3</u>~~2.~~ For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
4. <u>4</u>~~3~~. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
5. <u>5</u>~~4~~. The guard height in assembly seating areas shall comply with Section 1028.14.
6. <u>6.</u>~~5.~~ Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: The purpose of this change is to require higher guards when a fixed bench is part of or immediately adjacent to a guard. The concern is child safety for when children stand on a seat and possibly tip over the guard. The reference back to the floor surface in new Item 4 is to clarify where the measurement for the drop-off for where a guard is required is different from the measurement for the guard height.

The changes to Exception 1 is to coordinate better with IRC. The guard height is permitted to be 36" both inside and outside the individual dwelling unit. Where a balcony or deck had a bench constructed as part of the guard, the guard height above the bench would be 36".

New exception 2 is to allow a 36" high guard along an interior balcony or mezzanine within a Group R-2 multi-story apartment. This would allow guards and handrails along stairways (current exceptions 2 and 3) to not have a large change in elevation at the top landing to meet up with the guard. For these buildings, if there is an exterior balcony for a unit, the guard height would be 42" minimum. That would include measurement from a bench if it was constructed as part of the guard.

The intent of this proposal is to coordinate with the proposal for perimeter guards along assembly seating being proposed by the ICC 300 Bleacher Safety Committee. It is not the intent for these provisions to apply to fixed assembly seating arrangements. There types of facilities have issues of line-of-sight, requirements for handrails and guards along aisle that are stepped, ramped or level, crowd issues, etc. that are more appropriately handled in Section 1028.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party.

The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E106-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1013.3-E-Baldassarra-CTC.docx

E107 – 12
1013.3 (IFC [B] 1013.3)

Proponent: Robert Wallach, AIA, Torti Gallas and Partners, Inc., representing self (rwallach@tortigallas.com)

Revise as follows:

1013.3 (IFC [B] 1013.3) Height. Required guards shall not be less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces:
2. On stairs, from the line connecting the leading edges of the tread nosings; and
3. On ramps, from the ramp surface at the guard.

Exceptions:

1. For occupancies in Group R-3, not more than three stories above grade in height ~~and within individual dwelling units in occupancies in Group R-2 not more than three stories above grade in height with separate means of egress,~~ required guards shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces or adjacent fixed seating.

2. For Group R-2 and R-3 units, required guards within the dwelling unit shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surface or fixed seating.

3~~2.~~ For occupancies in Group R-3, and within dwelling units in Group R-2, guards on the open side of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.

4~~3.~~ For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* also serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

5~~4.~~ The *guard* height in assembly seating areas shall comply with Section 1028.14.

6~~5.~~ Along *alternating tread devices* and ship ladders, *guards* whose top rail also serves as a *handrail*, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.

Reason: As currently written, guards at dropoffs within the units such as at lofts would be allowed to be 36” for 3-story buildings, but 42” at buildings of more stories, although the potential fall distance would be the same. It is logical that balcony or deck guards be regulated relative to building height, but not the interior conditions. Current exception 2, which has been in the Code for a long time, allows a reduced guard height at stairs within the units in R-2 regardless of the height of the building and regardless of whether there is a separate means of egress. Guards at lofts or other similar interior conditions should be treated similarly.

Cost Impact: The code change will reduce the cost of construction

E107-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1013.3-E-WALLACH

E108 – 12

1013.6, 1013.7, Chapter 35 (IFC [B] 1013.6, 1013.7, Chapter 80) (IMC [B] 304.11, Chapter 15)

Proponent: Dean Kalahar, Ascend Cleaning and Restoration, LLC, representing Ascend Cleaning & Restoration. LLC (dean.kalahar@gmail.com)

Revise as follows:

1013.6 (IFC [B] 1013.6) Mechanical equipment, systems and devices. *Guards s*hall be provided where ~~appliances, equipment, fans, roof hatch openings, and other~~ various components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The *guard* shall be constructed so as to prevent the passage of a sphere 21 inches (533 mm) in diameter. The *guard* shall extend not less than 30 inches (762 mm) beyond each end of such ~~appliance, equipment, fan, or~~ various component.

> **Exception:** Permanent fall arrest/restraint anchorage connector devices meeting ANSI/ASSE Z 359.1 affixed for use during the entire roof covering lifetime. The devices shall be re-evaluated for possible replacement when the entire roof covering is replaces. The devices shall be placed no more than 10 feet (3048 mm) on center along hip and ridge lines and placed no less than 10 feet (3048 mm) from the roof edge or open side of the walking surface.

1013.7 (IFC [B] 1013.7) Roof access. *Guards* shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent passage of a sphere 21 inches (533 mm) in diameter.

> **Exception:** Permanent fall arrest/restraint anchorage connector devices meeting ANSI/ASSE Z 359.1 affixed for use during the entire roof covering lifetime. The devices shall be re-evaluated for possible replacement when the entire roof covering is replaces. The devices shall be placed no more than 10 feet (3048 mm) on center along hip and ridge lines and placed no less than 10 feet (3048 mm) from the roof edge or open side of the walking surface.

IMC [B] 304.11 Guards. Guards shall be provided where ~~appliances, *equipment*, fans, or other~~ various components that require service and roof hatch openings are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall extend not less than 30 inches (762 mm) beyond each end of such ~~appliances, *equipment*, fans,~~ various components and roof hatch openings and the top of the guard shall be located not less than 42 inches (1067 mm) above the elevated surface adjacent to the guard. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533 mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code.*

> **Exception:** Permanent fall arrest/restraint anchorage connector devices meeting ANSI/ASSE Z 359.1 affixed for use during the entire roof covering lifetime. The devices shall be re-evaluated for possible replacement when the entire roof covering is replaces. The devices shall be placed no more than 10 feet (3048 mm) on center along hip and ridge lines and placed no less than 10 feet (3048 mm) from the roof edge or open side of the walking surface.

Add new standard to IBC Chapter 35, IFC Chapter 80 and IMC Chapter 15.

<u>ASSE</u>
<u>American Society of Sanitary Engineering</u>
<u>901 Canterbury, Suite A</u>
<u>Westlake, OH 44145</u>

<u>ANSI/ASSE Z359.1-2007, Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components, Part of the Fall Protection Code</u>

Reason: The existing code provisions requiring the construction of guards do not adequately address the expanding list of equipment, assemblies, systems, devices and items that are now commonly being placed on roof tops and elevated walking surfaces that require routine maintenance. The current provisions of these sections require guards to be constructed as a method of fall protection provided for service and installation workers. The code change proposal adds clarity to the current code language by adding additional specific items that are typical placements on roofs and elevated walking surfaces. This expands the fall protection, life-safety provisions to a growing number of trades and service workers that are working on elevated surfaces. The proposal also provides an alternate method of compliance with the inclusion of a exceptions which allow for the installation of fall arrest/restraint anchorage connector devices meeting ANSI Z359.1 which is the nationally recognized consensus general industry standard used nationally. The proposed exception is a choice made by the designer and building owner that provides design flexibility and the opportunity to lower construction cost associated with building guards. The proposal will increase the uniform application of this section of the code. The Bureau of Labor Statistics, US Department of Labor reports the fatalities due to falls for the years from 1998 to 2010 are second to only highway incidents, with an average of 743 fatalities each year over this 12 year period. Of the 635 fatal falls in 2010 one third are from falls from ladders or roofs. In 2010 the construction industry had the highest number of fatal occupational injuries. In 2010 for nonfatal falls the median number of days away from work due to falls to a lower level was 14 days. Clearly the code needs to be improved to provide fall protection where mechanical equipment, appliances, equipment, fans, roof hatch openings, solar arrays, solar water heaters, photovoltaic panels, skylights, chimneys, gutters, attic vents, and ventilators, satellite dishes, antennas, television/radio/internet and other communication equipment and all other machinery and other components that require service are located on elevated surfaces more than 30 inches above a lover level.

Cost Impact: The code change proposal will not increase the cost of construction because the current code provisions can be interpreted to have the intent to require guards at all elevated working level more than 30 inches above a floor, roof or grade. The inclusions of exceptions provide a choice to lower the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/ASSE Z359.1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

E108-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1013.6-E-Kalahar.doc

E109-12
1013.8 (IFC [B] 1013.8)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1013.8 (IFC [B] 1013.8) Window ~~sills~~ openings. All windows ~~I~~in ~~Occupancy~~ Groups R-2 and R-3 buildings ~~, one- and two-family and multiple-family~~ including dwelling~~s~~ units, where the ~~opening~~ top of the sill ~~portion~~ of an operable window opening is located ~~more~~ less than 36 inches above the finished floor and greater than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, ~~the lowest part of the clear opening of the window shall be at a height not less than 36 inches (915 mm) above the finished floor surface of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4-inch-diameter (102 mm) sphere where such openings are located within 36 inches (915 mm) of the finished floor.~~ shall comply with one of the following:

~~**Exceptions:**~~

1. Operable windows where the top of the sill ~~portion~~ of the opening is located more than 75 feet (22 860 mm) above the finished grade or other surface below and that are provided with window fall prevention devices that comply with ASTM F 2006.
2. Operable windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position.
3. Operable windows whose openings ~~that~~ are provided with window fall prevention devices that comply with ASTM F 2090.
4. Operable windows that are provided with window opening control devices that comply with Section 1013.8.1.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the C

TC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The CTC Study Group on Child Window Safety examined Section 1013.8 during the preparation of the code change for existing buildings and several questions came up regarding the original intent and the clear scope of what was being regulated. Reviewing all the code changes that led to the current language, we concluded that the limitation on window openings and the requirement for use of protection devices was focused on dwelling units within buildings. We also felt that any such buildings would have a high incidence of exposure by small children to other window openings where they might fall and be injured.

Therefore, we have clarified the language specifying that it is all windows in an R-2 or R-3 building which has dwelling units in it. Similarly, we have clarified that the height is to be measured to the top of the sill of an operable window. Finally, the exceptions aren't actually exceptions, but conditions where various devices and their standards are allowed to be used.

Cost: The reduced time required to understand and apply the section properly should reduce the construction costs associated with determining compliance.

E109-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1013.8-E-BALDASSARRA-CTC.docx

E110-12
713.14.1, 1014.2, 1018.6, 3007.7, 3008.7 (IFC [B] 1014.2, 1018.6)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1014.2 (IFC [B] 1014.2) Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an exit.

   Exception: Means of egress are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. An exit access shall not pass through a room that can be locked to prevent egress.
3. Means of egress from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.
4. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

   Exceptions:

   1. Means of egress are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
   2. Means of egress are not prohibited through stockrooms in Group M occupancies when all of the following are met:
      - 2.1 The stock is of the same hazard classification as that found in the main retail area;
      - 2.2 Not more than 50 percent of the exit access is through the stockroom;
      - 2.3 The stockroom is not subject to locking from the egress side; and
      - 2.4 There is a demarcated, minimum 44-inch-wide (1118 mm) aisle defined by full- or partial-height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.

5. Exit access through an enclosed elevator lobby is permitted. Access to at least one of the required exits shall be provided without travel through the enclosed elevator lobbies required by Sections 713.14.1, 3007 or 3008. Where the path of exit access travel passes through an enclosed elevator lobby the level of protection required for the enclosed elevator lobby is not required to be extended to the exit unless direct access to an exit is required by other sections of this code.

1018.6 (IFC [B] 1018.6) Corridor continuity. Fire-resistance-rated *corridors* shall be continuous from the point of entry to an *exit*, and shall not be interrupted by intervening rooms. Where the path of egress travel within a fire-resistance-rated *corridor* to the *exit* includes travel along unenclosed *exit access stairways* or *ramps*, the *fire resistance-rating* shall be continuous for the length of the *stairway* or *ramp* and for the length of the connecting *corridor* on the adjacent floor leading to the *exit*.

Exceptions:

1. Foyers, lobbies or reception rooms constructed as required for *corridors* shall not be construed as intervening rooms.

2. <u>Enclosed elevator lobbies as permitted by Item 5 of Section 1014.2 shall not be construed as Intervening rooms.</u>

Revise as follows:

713.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code. <u>Egress through an elevator lobby shall be permitted in accordance with Item 5 of Section 1014.2.</u>

Revise as follows:

3007.7 Fire service access elevator lobby. The fire service access elevator shall open into a fire service access elevator lobby in accordance with Sections 3007.7.1 through 3007.7.5. <u>Egress is permitted through the elevator lobby in accordance with Item 5 of Section 1014.2.</u>

> **Exception:** Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to open into an elevator lobby in accordance with Section 708.14.1.

3008.7 Occupant evacuation elevator lobby. The occupant evacuation elevators shall open into an elevator lobby in accordance with Sections 3008.7.1 through 3008.7.7. <u>Egress is permitted through the elevator lobby in accordance with Item 5 of Section 1014.2.</u>

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is one of several proposals submitted by the CTC Elevator lobby SG. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies, with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link.
http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

Cost Impact: None

E110-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.14.1 #2-E-BALDASSARRA-CTC.docx

E111 – 12
Table 1014.3 (IFC [B] Table 1014.3)

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Compressed Gas Association (pmclaugma@aol.com)

Revise as follows:

TABLE 1014.3 (IFC [B] TABLE 1014.3)
COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)		WITH SPRINKLER SYSTEM (feet)
	Occupant Load		
	OL ≤ 30	OL > 30	
B, S[d]	100	75	100 [a]
U	100	75	75 [a]
F	75	75	100 [a]
H-1, H-2, H-3	Not Permitted	Not Permitted	25 ~~[a]~~ <u>[g]</u>
<u>H-4</u>	<u>Not Permitted</u>	<u>Not Permitted</u>	<u>75</u><u>[g]</u>
R-2	75	75	125 [b]
R-3[e]	75	75	125 [b]
I-3	100	100	100 [a]
All others [c, f]	75	75	75 [a, b]

For SI: 1 foot = 304.8 mm.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
c. For a room or space used for assembly purposes having fixed seating, see Section 1028.8.
d. The length of a common path of egress travel in a Group S-2 open parking garage shall not be more than 100 feet (30 480 mm).
e. The length of a common path of egress travel in a Group R-3 occupancy located in a mixed occupancy building.
f. For the distance limitations in Group I-2, see Section 407.4.
<u>g. Occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.1.</u>

Reason: H-1 thru H-4 occupancies are required to be sprinklered, however, if the H occupancy is located within another occupancy, that occupancy may or may not be sprinklered because the sprinkler system is not required throughout the building per 903.2.5.1. As written, the common path of travel distance would not apply and there is no guidance on what the common path of travel distance should be. Furthermore, the current footnote can lead to erroneous interpretation of the code requiring the building to be spinklered throughout. In our opinion this was never the intent of this table. H occupancies cannot exit through a more hazardous occupancy, therefore the common path of egress travel allowed within the H occupancy seem reasonable when exiting through another occupancy of lesser hazard. The proposal also moves H-4 occupancies, from "All others" row, to its own row, changes the footnote, and correctly indicates that H-4 occupancies are not permitted to be without sprinkler systems.

Cost Impact: The code change proposal will not increase the cost of construction.

E111-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1014.3-E-MCLAUGHLIN.doc

E112 – 12
1014.3.1 (NEW) [IFC [B] 1014.3.1 (NEW)]

Proponent: Brad Emerick, P.E., City and County of Denver Fire Prevention representing the Fire Marshals Association of Colorado (FMAC) (brad.emerick@denvergov.org)

Add new text as follows:

1014.3.1 (IBC [F] 1014.3.1) Paths of egress travel. From the terminus of the *common path of egress travel*, two separate and distinct paths shall be provided that diverge at a minimum rate of 7 feet for every 10 feet of travel along the paths. Divergence shall continue until one of the following is attained:

1. The paths are separated by a distance equal to the separation required by Section 1015.2.1, or
2. An exit access doorway or exit is reached by one of the paths.

Exception: Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the divergence rate shall not be less than 5 feet for every 10 feet traveled along the paths until Item 1 or 2 above is attained.

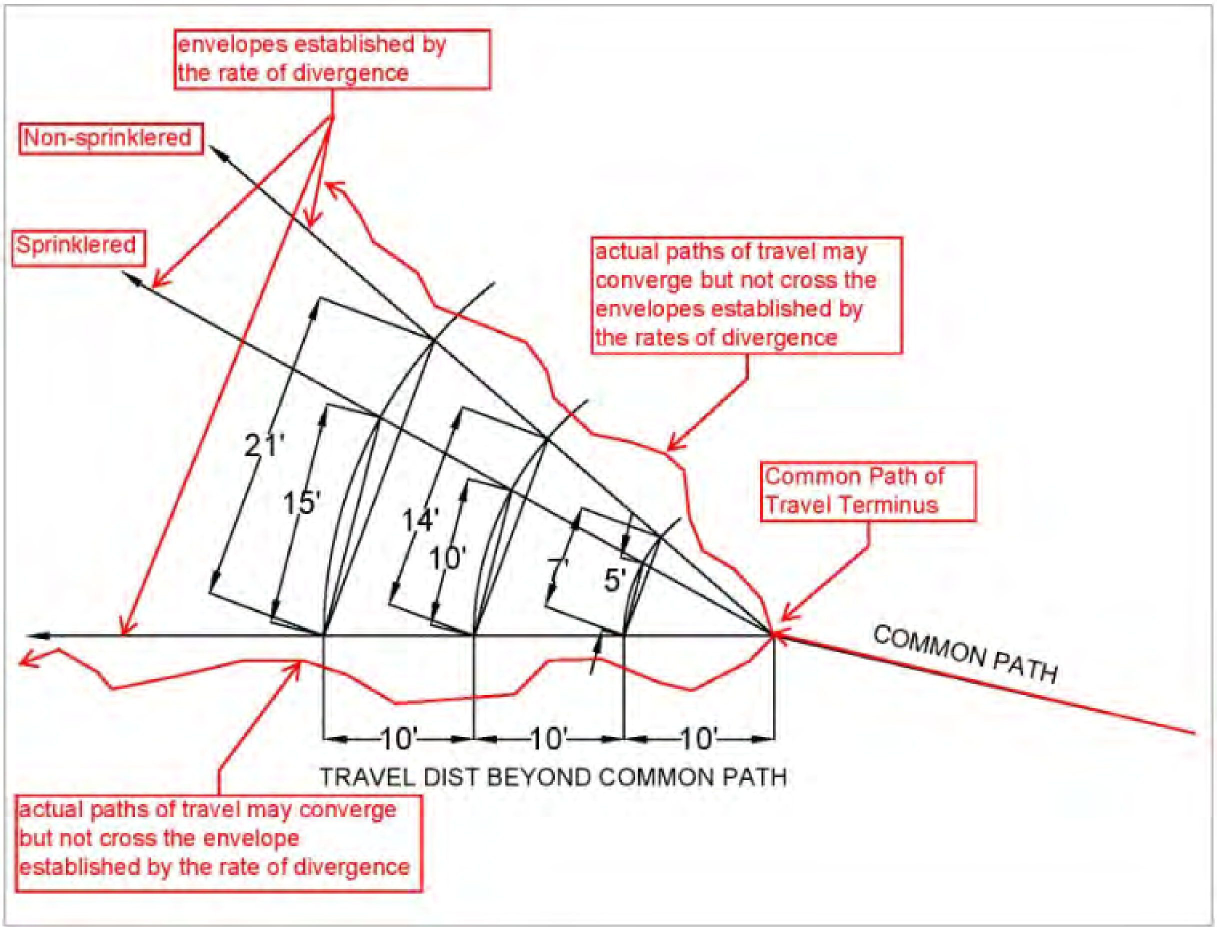
Reason: The only place in the code requiring "two separate and distinct paths" is in a definition. Though it's not always possible, in general, requirements should be in the body of the code.

In addition, the letter of the code allows the "two separate and distinct paths" required in the definition of Common Path of Egress Travel to parallel each other (even converge as long as they do not merge) with no minimum separation distance. The only criteria are that the paths be "separate and distinct" which are not defined. Because no minimum separation is established, the primary intent of two paths (i.e., that a single incident cannot block both) is repeatedly contested. Previous proposals to codify the concept that these paths be divergent were voted down in part because a fixed separation could not be applied at the point where the Common Path of Egress Travel terminates (terminus).

The proposed section attempts to address these by establishing a minimum divergence rate in the body of the code based on distance traversed from the terminus of the common path. An exception is proposed that is consistent with the reduced exit or exit access separation permitted for a sprinklered building (i.e., sprinklered ~ 2/3 non-sprinklered).

Though the divergence rates of 45 degrees (non-sprinklered) and 30 degrees (sprinklered) were in the original draft of this proposal, the rates of 7 feet per 10 feet of travel (approximately a 42 degree angle) and 5 feet per 10 feet of travel (approximately a 29 degree angle) are expressed in a way that is easier to verify on drawings and in the field.

The figure below depicts a common path of travel coming in from the lower right, and the two rates of divergence (sprinklered and non-sprinklered) from its terminus. The straight lines with arrows represent the envelopes established by the proposed divergence rates. To keep the number of lines on the drawing to a minimum, both rates are measured from a common horizontal line. The squiggly red lines outside the non-sprinklered divergence rate represent actual travel paths and attempt to illustrate that in a non-sprinklered building, these paths may converge as long as they do not cross the envelope established by the minimum divergence rate of 7 feet for every 10 feet of travel. The sprinklered divergence rate is depicted for comparison.



Cost Impact: This code change proposal will not increase the cost of construction.

E112-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1014.3.1(new)-E-Emerick.doc

E113 – 12
1015.1, 1015.1.1 (IFC [B] 1015.1, 1015.1.1)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1015.1 (IFC [B] 1015.1) Exits or exit access doorways from spaces. Two *exits* or *exit access* doorways from any space or portion of the exit access shall be provided where one of the following conditions exists:

1. The *occupant load* of the space exceeds one of the values in Table 1015.1.

   Exceptions:

   1. In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. Care suites in Group I-2 occupancies complying with Section 407.4.3.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

1015.1.1 (IFC [B] 1015.1.1) Three or more exits or exit access doorways. Three *exits* or *exit access doorways* shall be provided from any space or portion of the exit access with an *occupant load* of 501 to 1,000. Four *exits* or *exit access doorways* shall be provided from any space or portion of the exit access with an *occupant load* greater than 1,000.

Reason: The term space is unclear and may imply a room when Section 1015.1 and 1015.1.1 typically must apply to a wide variety of conditions and combinations of rooms, areas or spaces in the aggregate that are contained in the exit access portion of a building.

Cost Impact: This change will not increase the cost of construction.

E113-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1015.1-E-Richardson.doc

E114 – 12
1015.2 (IFC [B] 1015.2)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) ((dennisrichardsonpe@yahoo.com)

Revise as follows:

1015.2 (IFC [B] 1015.2) Exit or exit access doorway arrangement. Required *exits* shall be located in a manner that makes their availability obvious. *Exits* shall be unobstructed at all times. *Exit* and *exit access doorways* shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2. <u>Exit access doorways, contributing to the total number of exits or exit access doorways required by Sections 1015.1 and 1015.1.1, shall lead to separate exits.</u>

Reason: The current language would appear to allow two of three required *exit access doorways* from a space to lead to a single exit and still be counted as two of the required exits or exit access doors from a space.

Cost Impact: This change will not increase the cost of construction.

E114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1015.2-E-Richardson.doc

E115 – 12
1015.2.1 (IFC [B] 1015.2.1)

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways. Where two *exits* or *exit access doorways* are required from any portion of the *exit access*, the *exit* doors or *exit access doorways* shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between *exit* doors or *exit access doorways*. Interlocking or *scissor stairs* shall be counted as one *exit stairway*.

Exceptions:

1. Where *exit access stairways* or *interior exit stairways* are interconnected by a 1-hour fire-resistance-rated *corridor* conforming to the requirements of Section 1018, the required *exit* separation shall be measured along the shortest direct line of travel within the *corridor*.
2. Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the *exit* doors or *exit access doorways* shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

Reason: This proposal allows exit access separation to be measured along a rated corridor for exit access stairways as well as for exit stairways. It is the rated corridor that provides a protected environment and justifies this method of measurement for exit stairways. The same justification applies for enclosed exit access stairways. While this provision has been in place for many years, changes in the 2012 Code justify this change. The 2012 IBC is the first edition that requires exit access stairs to be enclosed, and allows them to be used in lieu of enclosed exit stairways.

Cost Impact: The code change proposal will not increase the cost of construction.

E115-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1015.2.1-E-Traxler.doc

E116– 12
Table 1016.2 (IFC [B] Table 1016.2)

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Compressed Gas Association (pmclaugma@aol.com)

Revise as follows:

**TABLE 1016.2 (IFC [B] TABLE 1016.2)
EXIT ACCESS TRAVEL DISTANCE[a]**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[c]
H-2	Not Permitted	100[~~c~~ d]
H-3	Not Permitted	150[~~c~~ d]
H-4	Not Permitted	175[~~c~~ d]
H-5	Not Permitted	200[~~c~~ d]

For SI: 1 foot = 304.8 mm.

a. *(no change)*

b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

d. Occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.1.

Reason: H-1 thru H-4 occupancies are required to be sprinklered, however, if the H occupancy is located within another occupancy, that occupancy may or may not be sprinklered because the sprinkler system is not required throughout. As written, the travel distance allowance would not apply and there is no guidance on what the travel distance should be. Furthermore, the current footnote has led to erroneous interpretation of the code requiring the building to be spinklered throughout. In our opinion this was never the intent of this table. H occupancies cannot exit through a more hazardous occupancy, therefore the travel distances allowed within the H occupancy seem reasonable when exiting through another occupancy of lesser hazard.

Cost Impact: The code change proposal will not increase the cost of construction.

E116-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1016.2-E-MCLAUGHLIN

E117 – 12
Table 1016.2, 1016.2.2(New) [IFC [B] Table 1016.2, 1016.2.2(New)]

Proponent: Carl F. Baldassarra, P.E., FSFPE, Rolf Jensen and Associates, Inc. representing Rolf Jensen and Associates (cbaldassarra@rjagroup.com); Tonya L. Hoover, California State Fire Marshal representing same

Revise as follows:

1016.2.2 (IFC [B] 1016.2.2) Group F-1 and S-1 increase. The maximum exit access travel distance shall be 400 feet (122 m) in Group F-1 or S-1 occupancies where all of the following are met:

1. The portion of the building classified as Group F-1 or S-1 is limited to one story in height;
2. The minimum height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet (7315 mm); and
3. The building is equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1.

TABLE 1016.2 (IFC [B] TABLE 1016.2)
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[c]
H-2	Not Permitted	100[c]
H-3	Not Permitted	150[c]
H-4	Not Permitted	175[c]
H-5	Not Permitted	200[c]
I-2, I-3, I-4	150	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:
Section 402.8: For the distance limitation in *malls*.
Section 404.9: For the distance limitation through an *atrium* space.
Section 407.4: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
Section 411.4: For the distance limitation in special amusement buildings.
Section 1014.2.2: For the distance limitation in Group I-2 Hospital Suites.
Section 1015.4: For the distance limitation in refrigeration machinery rooms.
Section 1015.5: For the distance limitation in refrigerated rooms and spaces.
Section 1016.2.2: For increased distance limitation in Group F-1 and Group S-1.
Section 1021.2: For buildings with *one exit*.
Section 1028.7: For increased limitation in assembly seating.
Section 1028.7: For increased limitation for assembly open-air seating.
Section 3103.4: For temporary structures.
Section 3104.9: For pedestrian walkways.

b. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where *automatic sprinkler systems* are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason:
BALDASSARA: This proposed change is intended to allow a 400-foot exit access travel distance for F-1 and S-1 buildings meeting certain criteria. The 2009/2012 editions of the International Building Code were revised to eliminate the 400-foot exit travel distance for large Group S-1 warehouse and large Group F-1 factory facilities equipped with smoke and heat vents. This change was made because thermally-activated vents were judged not to warrant such an increase. A companion change to allow such an increase was not approved, yet there remains a need to have extended exit travel distances in such buildings because of the nature of their function. The allowance of an exit travel distance of 400 feet has existed in the IBC and Legacy codes for warehouses and factories

with non-combustible products since the early 1960s without any adverse experience, both in buildings with and without smoke and heat vents.

The California State Fire Marshal's Office (CSFM) has reviewed this subject because of the pressing need to find a solution for large F-1 and S-1 buildings. A study was commissioned and published, "*Report to the California State Fire Marshal on Exit Access Travel Distance of 400 Feet by Task Group 400, December 20, 2010*," and subsequent "*Fire Modeling Analysis Report,*" revised July 20, 2011, provide the technically-based rationale for increased exit travel distance without any special protection. That is the basis for this change. [NOTE TO ICC STAFF: PROVIDE LINKS TO THE REPORTS FOR INTERESTED PARTIES.] Future work by both the ICC Code Technology Committee and the CSFM in the next year will further improve the protection for such facilities; such provisions will be proposed for the IFC in the Group B Code Change cycle next year.

This proposal amends the above sections and add additional criteria necessary to reinstate a 400 foot travel distances for large warehouse and large factory facilities. An addition to Footnote a in Table 1016.2 is added and makes a reference to a new Section 1016.2.2.

Section 1016.2.2 is added to provide the criteria for an increased exit access travel distance of 400 feet in Group F-1 and S-1 occupancies. The criteria for application of this section, based upon the criteria in the reports, includes:

1. The travel distance increase is only applicable to portions of the building which are one story in height. The allowance for a travel distance of 400 feet in the 2006 IBC is limited to buildings which are one story in height, so this concept is carried forward. This would not preclude a building with a one story storage warehouses or factory area and a two story office or a mezzanine from also utilizing this section. The section is written so that the one story limitation is only applicable to the area where the 400 foot travel distance is utilized.
2. The minimum height from floor, ceiling, or roof deck above, must be 24 feet. The 24 feet of clearance is based on the "Fire Modeling Analysis Report" by Aon Fire Protection Engineering. The 24 feet ceiling height is used to provide a volume for the smoke to accumulate during the fire and provide time for egress, much like the concept used for smoke-protected seating. Control mode sprinklers were utilized in the fire modeling to demonstrate the more conservative approach. Certainly, ESFR or specialty sprinklers would be more effective.

HOOVER: The 2009/2012 International Building Code (IBC) and International Fire Code (IFC) revised the allowable exit travel distance for large Group F-1 factory facilities and large Group S-1 warehouses from that of the 2006 IBC and IFC and prior Legacy codes. In the 2009/2012 IBC/IFC, warehouses and factories with non-combustible products are allowed an exit access travel distance of 400 feet; however, when those same buildings contain combustible materials, the maximum exit access travel distance is reduced to 250 feet.

The allowance of an exit travel distance of 400 feet has existed in the IBC/IFC and Legacy codes for warehouses and factories with non-combustible products since the early 1960s. The allowance of an exit travel distance of 400 feet for <u>all</u> warehouses and factories has existed for well over a decade.

The California State Fire Marshal and the Task Group 400 recognized that the item was deleted from the 2009 IBC/IFC, which has been carried forward to the 2012 IBC/IFC. The ultimate goal was to revise the IBC/IFC, however a revision processed through the International Code Council Code change process would not appear in the code until the 2015 edition making adoption not possible until 2015 or later due to the regulatory adoption process. This proposal will re-instate the travel distance allowance of 400 for F-1 and S-1 occupancies, but it is not based on the installation of smoke/heat vents, it is based on fire modeling and egress times.

This proposal amends Table 1016.2 and adds a new section 1016.2.2 that contains additional criteria necessary to reinstate a 400 foot travel distances for large factory facilities and large warehouses. The report, "*Report to the California State Fire Marshal on Exit Access Travel Distance of 400 Feet by Task Group 400 December 20, 2010*" ("report"), and subsequent "*Fire Modeling Analysis Report*" (Appendix A to the report) provide the complete rationale. Initially, a simple addition to Footnote a in Table 1016.2 is added to make a reference to a new Section 1016.2.2.

Section 1016.2.2 is added to provide the criteria for an increased exit access travel distance of 400 feet in certain large Group F-1 and S-1 occupancies. The criterion for application of this section includes:

1. The travel distance increase is only applicable to portions of the building which are one story in height. The allowance for a travel distance of 400 feet in the 2006 IBC was also limited to buildings which are one story in height, so this concept is carried forward.
   This would not preclude a building with a one story storage warehouses or factory area and a two story office or a mezzanine from also utilizing this section. The section is written so that the one story limitation is only applicable to the area where the 400 foot travel distance is utilized. The two story office building would still be limited to 300 feet as indicated in Table 1016.1.
2. The minimum height from floor to ceiling above, or the underside of the roof deck, must be 24 feet. The 24 feet is measured to the bottom of the roof or ceiling above. The height is specified as 'minimum.' It is not intended to be applied to an 'average' height; it is the minimum. It is assumed that beams and purlins will extend down below this height of 24 feet.
   The 24 feet of clearance is based on the "Fire Modeling Analysis Report" by Aon Fire Protection Engineering. The 24 feet ceiling height is used to provide a volume for the smoke to accumulate during the fire event and provide time for egress. The report evaluated various size buildings and through fire modeling established safe egress times in those facilities. The report provides the basis and justification to the 400 foot exit access travel distance. Control mode sprinklers were utilized in the fire modeling to demonstrate the more conservative approach. Certainly, ESFR or specialty sprinklers would be more effective.
   The complete report can be found on the California State Fire Marshal's website at:
   http://osfm.fire.ca.gov/codedevelopment/pdf/2010interimcodeadoption/Part-9_ISOR_Attachment_A_rev20110720comp.pdf

This code change is the first of two proposals being submitted by the California State Fire Marshal regarding large factory facilities and large warehouses. This code change provides a sound solution to allowing an exit travel distance of 400 feet. The next code change proposal considers the fact that firefighting operations are impacted when larger buildings are constructed where the exit access travel distance is allowed to be 400 feet. As a result, mitigation to the firefighting impact is to be proposed to the IFC in the 2013 ICC Group B code development schedule.

Cost Impact:
BALDASSARA: None.

HOOVER: This code change will likely decrease the cost of construction for F-1 and S-1 buildings with a travel distance in excess of 250 feet because strict compliance would require more exits unless a performance-based alternate method of design was approved.

E117-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1016.2.2 (new)-E-Baldassarra-T1016.2-E-HOOVER.doc

E118-12
1017.3, 1017.5 (IFC [B] 1017.3, 1017.5)

Proponent: S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

SECTION 1017
AISLES

1017.1 (IFC [B] 1017.1) General. Aisles and aisle accessways serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles or aisle accessways shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. The required width of aisles shall be unobstructed.

Exception: Encroachments complying with Section 1005.7.

1017.2 (IFC [B] 1017.2) Aisles in assembly spaces. Aisles and aisle accessways serving a room or space used for assembly purposes shall comply with Section 1028.

1017.3 (IFC [B] 1017.3) Aisles in Groups B and M. In Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than ~~36 inches (914 mm)~~ that required for corridors by Section 1018.2.

Exception: Nonpublic aisles serving less than 50 people and not required to be accessible by Chapter 11 need not exceed 28 inches (711 mm) in width.

1017.4 (IFC [B] 1017.4) Aisle accessways in Group M. *(no change)*

1017.5 (IFC [B] 1017.5) Aisles in other than assembly spaces and Groups B and M. In other than rooms or spaces used for assembly purposes and Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than ~~36 inches (914 mm)~~ that required for corridors by Section 1018.2.

Exception: Nonpublic aisles serving less than 50 people and not required to be accessible by Chapter 11 need not exceed 28 inches (711 mm) in width.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 3 open meetings and over 15 workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

Aisles are the main paths for means of egress through many types of spaces, such as between cubicles in open office plans, between merchandise pads in display areas in stores, between shelving in storage areas and between equipment in factories. While not confined by walls as corridors are, they should still be sized consistently with corridors so occupants could exit the building safely. The 2012 IBC has a Table in 1018.2 that provides minimum corridor widths in a clear manner. The exception currently in 1017.3 is repeated in 1017.5 for consistency between use groups.

BCAC has code changes in dealing with aisles in 1005, 1009, 1017 and 1028 as well as a transition between aisle stairs and stairways. The intent is for all four proposals to correlate; however this change can stand by itself.

Cost Impact: This code change proposal will not increase the cost of construction.

E118-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1017.3-E-BAJNAI-BCAC.docx

E119-12
1017.3, 1017.5 (IFC [B] 1017.3, 1017.5)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1017.3 (IFC [B] 1017.3) Aisles in Groups B and M. In Group B and M occupancies, the minimum clear *aisle* width shall be determined by Section 1005.1 for the *occupant load* served, but shall not be less than ~~36 inches (914 mm).~~ that required for corridors by Section 1018.2.

> **Exception:** Nonpublic *aisles* serving less than 50 people and not required to be *accessible* by Chapter 11 need not exceed 28 inches (711 mm) in width.

1017.5 (IFC [B] 1017.5) Aisles in other than assembly spaces and Groups B and M. In other than rooms or spaces used for assembly purposes and Group B and M occupancies, the minimum clear *aisle* width shall be determined by Section 1005.1 for the *occupant load* served, but shall not be less than ~~36 inches (914 mm).~~ that required for corridors by Section 1018.2.

Reason: The change for aisles in IBC Sections 1107.3 and 1017.5 is for coordination with the new corridor width Table 1018.2 and the language for ramp width in Section 1010.6.1. Also, aisles, corridors and ramps are all using the same capacity numbers in Section 1005.3.2. Aisle used for movement of patient beds should also meet 96".

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E119-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1017.3-E-WILLIAMS-ADHOC.doc

E120 – 12
1017.5 (IFC [B] 1017.5)

Proponent: Lynn W. Manley, Staff Architect, Illinois Department of Public Health (IDPH), Health Care Facilities and Programs (HCF&P) representing self (lynn.manley@illinois.gov)

Revise as follows:

1017.5 (IFC [B] 1017.5) Aisles in hospitals, ambulatory care facilities and end stage renal dialysis units. The clear aisle width for hospitals, ambulatory care facilities and end stage renal dialysis units shall be not less than 44 inches (1118 mm). The clear aisle width of areas where patient movement is by wheelchair shall be not less than 60 inches (1524 mm). The clear aisle width of areas where patient movement is by gurney or bed shall be not less than 72 inches (1829 mm).

> **Exception:** For areas that do not provide patient access, patient treatment or means of egress for patients, the minimum clear aisle width shall be determined by Section 1005.1, based upon the occupant load served, but shall not be less than 36 inches (914 mm).

~~1017.5~~ 1017.6 (IFC [B] ~~1017.5~~ 1017.6) Aisles in other ~~than assembly spaces and Groups B and M~~ occupancies. In ~~other than~~ rooms or spaces used for ~~assembly purposes and Group B and M~~ occupancies not falling within the purview of Section 1017.2, 1017.3 or 1017.5, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall be not less than 36 inches (914 mm).

Reason: This change is proposed as a requirement for new construction. However, similar requirements may be proposed in the International Fire Code for existing facilities. The 36 inch and 44 inch dimensions are consistent with the requirements of NFPA 101 for the same occupancies. The 60 inch requirement is consistent with the minimum requirements of A.D.A. The 72 inch requirement is needed to provide space for patient movement by bed or gurney for means of egress but also for patient treatment where quick movement may be critical. The 72 inch clear dimension is really needed where aisles are provided for surgical suites, for emergency departments, intensive care units, etc. Most of these spaces are typically designed with 8'-0" aisles by experienced health care designers; however the aisles quickly become obstructed by furniture, equipment supplies and/or patients. The minimum 72" clear aisle dimension also provides space for patients during extreme emergency events.

This proposal is also intended to limit the use of aisles in new construction. Holding of patients or treatment of patients in aisles should not be permitted as the aisles are not designed for such and may violate several Medicare Requirements (Infection Control, Patient Privacy) along with NFPA 99. Patients should be held or treated in rooms, holding areas, niches or alcoves off of the aisles that are designed for patients and that have normal and emergency power electrical outlets and medical gas outlets that are required by NFPA 99)

Cost Impact: There is little of no additional cost for this requirement because it is consistent with current design practices. However, there is an additional cost to plan and provide additional space for the things that typically obstruct the aisle.

E120-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1017.6 (NEW)-E-MANLEY.pdf.doc

E121 – 12
Table 1018.1 (IFC [B] Table 1018.1)

Proponent: Thomas S. Zaremba/ Roetzel & Andress, Glazing Industry Code Committee ("GICC") and Primary Fire Rated Glazing Manufacturers (tzaremba@ralaw.com)

Revise as follows:

TABLE 1018.1 (IFC [B] TABLE 1018.1)
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)[c]	
		Without sprinkler system	With sprinkler system
H-1, H-2, H-3	All	Not permitted	1
H-4, H-5	Greater than 30	Not permitted	1
A, B, ~~E,~~ F, M, S, U	Greater than 30	1	0
<u>E</u>	<u>Greater than 30</u>	<u>1</u>	~~0~~ <u>1</u>
R	Greater than 10	Not permitted	0.5
I-2[a]	All	Not permitted	0
I-1, I-3	All	Not permitted	1[b]

Reason: According to a June 2011 NFPA Research Report: "U.S. fire departments responded to an estimated average of ***6,260 structure fires*** in educational properties in 2005-2009, annually. These fires caused annual averages of ***85 civilian fire injuries*** and ***$112 million in direct property damage***. The majority of fires and losses in educational properties were in nursery through high schools." Source: Evarts, *Structure Fires in Educational Properties,* NFPA Fire Analysis and Research Division (June 2011); emphasis added.

Day Care Centers averaged 590 structure fires; 8 injuries; and $4.5 Million in direct property damage annually while K-12 educational facilities averaged an annual 4510 structure fires; 68 injuries; and $95 Million in direct property damage. Source: Evarts, *Structure Fires in Educational Properties,* NFPA Fire Analysis and Research Division (June 2011).

Most educational facilities built since the late 1970s are required to have automatic sprinkler and other fire/smoke alarm systems which, according to FEMA, likely explains why no deaths from school structure fires were reported in 2002. As displayed in the 2002 FEMA Table below, fires in educational facilities were generally less damaging than non-residential fires; ***however***, it is important to note that ***fires in schools were generally more injurious than other non-residential structure fires***.

LOSS MEASURES FOR SCHOOL STRUCTURE FIRES
(2002)

Loss Measure	All Non-Residential Structure Fires	School Structure Fires
$ Loss/Fire	$21,505	$15,956
Injuries/1,000 Fires	***14.4***	***22.0***
Fatalities/1,000 Fires	1.1	0.0

Source: FEMA, *Topical Fire Research Series, School Fires,* Vol. 4, Issue 6 (December 2004); emphasis added.

Clearly, the documented number of fires, injuries and the extensive damage done annually to educational occupancies, warrants increased fire protection for students, teachers, property and fire service members entering the buildings after fires are reported, either to rescue students that may be missing from the evacuation count, or to just put out the fires.

In the past, the principal impediment to adopting added fire protection features has been the increased cost of construction. However, SSOE Group, a world-wide architectural firm with extensive experience in the design of educational occupancies, recently completed a study of the costs associated with adding fire rated exit corridors to schools with automatic sprinkler systems. SSOE took the actual costs of three different schools that it had actually designed recently with automatic sprinkler systems and determined the additional costs necessary to fire rate their exit corridors in accordance with the 2009 edition of the IBC.

SSOE used three different schools as the basis for its report. The first is a 69,200 sq.ft. elementary school. The second is a 175,502 sq.ft. middle school. The third is a 401,797 sq.ft. high school.

SSOE's summary comparing the costs to install automatic sprinkler systems to the costs of fire rating the exit corridors in these schools is set out below. From SSOE's summary, it is clear that adding fire rated corridors actually costs **<u>less</u>** than it does to install automatic sprinkler systems.

COST SUMMARY	Elementary school	Middle School	High School
Total Building Cost less equipment	$10,427,000.00	$18,929,000.00	$42,851,000.00
Automatic sprinkler systems			
Initial cost	$188,916.00	$367,688.01	$643,280.31
Maintenance over life cycle	$5,476.78	$5,476.78	$5,476.78
Fire protection totals	$194,392.78	$373,164.79	$648,757.08
Fire rated exit corridors			
Initial commissioning cost	$1,580.00	$4,385.00	$7,116.00
FRJS	$38,710.00	$107,432.50	$174,342.00
Costs for door upgrades	$15,550.00	$17,450.00	$55,350.00
Pv of Annual inspection costs	$10,588.44	$25,193.18	$33,590.90
Cost difference for fire rated glazing	$83,910.00	$115,740.00	$121,640.00
Duct penetrations	$16,924.80	$24,403.20	$41,229.60
Other penetrations	$5,266.67	$14,616.67	$23,720.00
PV of Additional penetrations over life cycle	$1,825.59	$4,563.98	$4,563.98
Fire rated exit corridor totals	$174,355.50	$313,784.53	$461,552.48
Fire rated corridor costs as a percentage of Automatic Sprinkler System	89.69%	84.09%	71.14%
Fire rated corridor costs as a percentage of Total Building Costs	**1.67%**	**1.66%**	**1.08%**

Adding fire rated exit corridors to E-occupancies will result in inherently safer school buildings at less cost than including automatic sprinkler systems. Moreover, according to the SSOE report, the added cost of adding fire rated corridors represents less than 2% of the total cost to build these schools or only:

1. 1.6% of the total $10.427 million cost to build the 69,200 sq. ft. elementary school;
2. 1.6% of the total $18.929 million cost to build the 172, 502 sq. ft. middle school; and
3. 1.08% of the total $42.851 million cost to build the 401,797 sq. ft. high school.

Finally, the base schools used in the SSOE were built with an expected life of fifty (50) years. When the costs of adding fire rated corridors are amortized over the 50 year anticipated life of these school buildings, the added cost is absolutely nominal.

As to those schools affected by the proposal, it would add compartmentalization and provide redundant life safety and fire protection features to E-occupancies to the same level of fire protection that is currently required in a number of I-occupancies (including assisted living facilities, congregate care facilities, halfway houses and social rehabilitation facilities). If adopted, this proposal would affect only E-occupancies (including day care centers) that are greater than 12,000 sq. ft. in size.

E-occupancies are a special case. They involve children. Fire and life safety protections should be redundant in E-occupancies, especially given the large number of fires experienced annually; the large number of injuries related to fires that are experienced annually; the large dollar losses experienced annually from fires in school properties; and the small overall cost to add fire rated corridors.

As the number of students served by our school systems increases with increasingly smaller adult-to-student ratios, the small added cost of construction should ***not*** be any impediment to the increased level of protection that this proposal would provide our children, their teachers and the fire service.

We urge the Committee to support this proposal.

Bibliography: 1. Evarts, *Structure Fires in Educational Properties,* NFPA Fire Analysis and Research Division (June 2011).
2. FEMA, *Topical Fire Research Series, School Fires,* Vol. 4, Issue 6 (December 2004).
3. SSOE, *Fire Rated Corridor Construction in Schools* (December 2011).

Cost Impact: This proposal will increase the cost of construction.

E121-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1018.1-E-Zaremba.doc

E122-12
1018.2 (IFC [B] 1018.2)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1018.2 (IFC [B] 1018.2) Width. The minimum width of *corridors* specified in Table 1018.2 shall be as determined in Section 1005.1.

> **Exception:** In Group I-2 occupancies, corridors are not required to have a clear width of 96 inches (2438 mm) in areas where there will not be stretcher or bed movement for access to care or as part of the defend in place strategy.

TABLE 1018.2 (IFC TABLE [B] 1018.2)
MINIMUM CORRIDOR WIDTH

Occupancy	Width (min)
Any facilities not listed below	44 inches (1118 mm)
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches (610 mm)
With a required occupancy capacity less than 50	36 inches (914 mm)
Within a dwelling unit	36 inches (914 mm)
In Group E with a *corridor* having a required capacity of 100 or more	72 inches (1829 mm)
In *corridors* and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be incapable of *self-preservation*	72 inches (1829 mm)
Group I-2 in areas where required for bed movement	96 inches (2438 mm)

Reason: Since hospitals typically include accessory spaces or non separated mixed use occupancies that are not patient care, the code official should have the clear ability to apply judgment in determining the appropriate means of egress components. For example a large assembly space may need certain Group requirements, while a mechanical space with no patient would not need an 8' corridor.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx

This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: This proposal could help to decrease the cost of construction by allowing a more efficient use of building square footage.

E122-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1018.2 #2-E-Williams-Adhoc.docx

E123 – 12
Table 1018.2 (IFC [B] Table 1018.2)

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

1018.2 (IFC [B] 1018.2) Width. The minimum width of *corridors* specified in Table 1018.2 shall be as determined in Section 1005.1.

**TABLE 1018.2 (IFC [B] TABLE 1018.2)
MINIMUM CORRIDOR WIDTH**

OCCUPANCY	WIDTH (minimum)
Any facilities not listed below	44 inches
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches
With a required occupancy capacity less than 50	36 inches
Within a dwelling unit	36 inches
In Group E with a corridor having a required capacity of 100 or more	72 inches
In corridors and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be incapable of self-preservation	72 inches
Group I-2 in areas <u>other than within care suites,</u> where required for bed movement	96 inches
<u>Group I-2 within care suites</u>	<u>44 inches</u>

For SI: 1 inch = 25.4 mm.

Reason: Over the past several cycles, the IBC has evolved to regulate the design of Group I-2 occupancies (hospitals and nursing care on a 24 hour basis) in a manner consistent with the regulations required for accreditation by the Centers for Medicare & Medicaid Services (CMS) and The Joint Commission (i.e., NFPA 101-2000; Life Safety Code). One of the biggest healthcare design features added in recent years is the concept of "care suites." By definition in IBC Section 202, a "care suite" is "A group of treatment rooms, care recipient sleeping rooms and their associated support rooms or spaces and circulation space within Group I-2 occupancies where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.3." Typical care suites are those where the patients need close supervision and monitoring, and include ICU areas. Because of the heighten awareness in the care suite with 24-hour supervision, some of the typical egress parameters are not necessary or applicable, in this case the mandate for the corridor in a care suite to be 96 inches wide. Within care suites patient movement is highly coordinated such that there is not the same level of unmonitored activity in the corridors, thus the extra width is not necessary.

Cost Impact: None

E123-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1018.1-E-RICE.doc

E124 – 12
1018.5.1 (IFC [B] 1018.5.1) (IMC [B] 601.2.1)

Proponent: Steven J. Clark, P.E., Aquatherm, representing self (steve.clark@aquathermpipe.com)

Delete without substitution:

~~**1018.5.1 (IFC [B] 1018.5.1) (IMC [B] 601.2.1) Corridor ceiling.** Use of the space between the *corridor* ceiling and the floor or roof structure above as a return air plenum is permitted for one or more of the following conditions:~~

1. ~~The *corridor* is not required to be of fire-resistance-rated construction;~~
2. ~~The *corridor* is separated from the plenum by fire-resistance-rated construction;~~
3. ~~The air-handling system serving the *corridor* is shut down upon activation of the air-handling unit *smoke detectors* required by the *International Mechanical Code*;~~
4. ~~The air-handling system serving the *corridor* is shut down upon detection of sprinkler waterflow where the building is equipped throughout with an *automatic sprinkler system*; or~~
5. ~~The space between the *corridor* ceiling and the floor or roof structure above the *corridor* is used as a component of an *approved* engineered smoke control system.~~

Reasons: Purpose of Code Change – To improve the health and life safety of buildings by eliminating a major loophole that lowers the construction requirements in one of the most critical areas of the building.

Corridors are the critical first choice means of egress for building occupants as well as the path used by First Responders to save lives and fight fires. Any reduction in building construction standards for corridors is at best ill-advised. Unfortunately, the current section offers multiple loopholes that give minimal direct savings in sheet metal costs while substantially driving up costs of numerous other trades. The current loophole allows air plenums formed out of cavities above the corridor, under the presumption that eliminating ductwork saves some construction costs. This is a false economy and a poor and unsafe practice for a number of reasons:

1. Due to fires that have started or spread through plenums, numerous codes regulate the construction and materials allowed in plenums. These requirements to have everything from pipes and insulation to control wiring be “plenum rated” have driven up the costs of construction for many of the other trades on the project. These “plenum rated” materials often contain hazardous materials that in the advent of a fire give off extremely toxic gases. These toxic gases will then go directly back into the corridor creating a life safety risk for occupants and First Responders.
2. Plenum air systems are impossible to clean due to the type of construction and the wires, cables and pipes that are in the way. Since this is the air the occupants are breathing, this can lead to numerous health issues.
3. Plenum air systems can grow mold.
4. Plenum return air systems are not compatible with the use or return air grill filters, which keep the return air system cleaner.
5. Plenum air systems typically contain materials that can produce VOX gases that then end up in the air stream.
6. Plenum return air systems present a fire hazard, where fires can start or are drawn into, can quickly spread and are very difficult to fight.
7. Plenums add considerable work load to the code enforcement community while offering no health or safety benefit.

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Cost Impact: The code change proposal will not increase the cost of construction. The cost of ducting air serving a corridor will be more than offset by the savings in avoiding “plenum rated” requirements for all other trades that run pipes, insulation, wires, cables, controls, etc….

There should be a substantial savings for the code enforcement community by eliminating the confusion and safety issues presented by the current loophole.

E124-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1018.5.1-E-Clark.doc

E125 – 12
1018.6 (IBC [F] 1018.6)

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1018.6 (IFC [B] 1018.6) Corridor continuity. Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms. Where the path of egress travel within a fire-resistance-rated corridor to the exit includes travel along unenclosed exit access stairways or ramps, the fire resistance-rating shall be continuous for the length of the stairway or ramp and for the length of the connecting corridor on the adjacent floor leading to the exit.

Exceptions ~~Exception~~:

1. Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.
2. Rooms or spaces that are adjacent and open to a fire−resistance−rated corridor, shall not be construed as intervening rooms; provided each room or space complies with the following:
   - 2.1 The space is constructed as required for corridors;
   - 2.2 The space is not occupied with Group H occupancy uses;
   - 2.3 The space does not contain any incidental uses listed in Table 509; and
   - 2.4 The space is arranged so as to not obstruct access to the required exits.

Reason: The original exception addressed areas typical of corridor access areas. The proposed addition addresses those spaces or rooms which may be adjacent and open to a fire rated corridor, and clarifies limitations of such general areas.

Cost Impact: The code change proposal will not increase the cost of construction.

E125-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1018.6-E-Dahmen.doc

E126 – 12
1019.4, 1026.5 (IFC [B] 1019.4, 1026.5)

Proponent: Steve Pfeiffer representing City of Seattle, Department of Planning & Development (steve.pfeiffer@seattle.gov)

Revise as follows:

1019.4 (IFC [B] 1019.4) Location. Exterior egress balconies shall have a minimum ~~fire~~ separation ~~distance~~ of 10 feet (3048 mm) measured <u>at right angles</u> from the exterior edge of the egress balcony to<u>:</u>

<u>1.</u> Adjacent lot ~~line~~ <u>lines</u>;
<u>2.</u> <u>Other portions of the building;</u> ~~and from~~
<u>3.</u> Other buildings on the same lot unless the adjacent building *exterior walls* and openings are protected in accordance with Section 705 based on *fire separation distance*.

1026.5 (IFC [B] 1026.5) Location. *Exterior exit stairways* and *ramps* shall have a minimum ~~fire~~ separation ~~distance~~ of 10 feet (3048 mm) measured <u>at right angles</u> from the exterior edge of the *stairway* or *ramp*, including landings, to<u>:</u>

<u>1.</u> Adjacent lot ~~line~~ <u>lines</u>;
<u>2.</u> <u>Other portions of the building;</u> ~~and from~~
<u>3.</u> Other buildings on the same lot unless the adjacent building *exterior walls* and openings are protected in accordance with Section 705 based on *fire separation distance*.

Reason: The purpose of this change is to clarify that an exterior exit stairway or egress balcony needs a minimum 10 feet separation where a building wraps around on itself, such as a U-shaped building. The phrase "at right angles" was added because the definition of fire separation distance measures from a wall rather than the exterior edge.

Cost Impact: The code change proposal will not increase the cost of construction.

E126-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1019.4-E-Pfeiffer.doc

E127 – 12

1015.2.2, 1021.1, Table 1021.1(New), 1021.2, Table 1021.2(1), Table 1021.2(2), 1021.2.1, 1021.2.2, 1021.2.3, 1021.2.4, 1021.2.5, 1021.3, 1021.3.1, 1021.4 (IFC [B] 1015.2.2, 1021.1, Table 1021.1(New), 1021.2, Table 1021.2(1), Table 1021.2(2), 1021.2.1, 1021.2.2, 1021.2.3, 1021.2.4, 1021.2.5, 1021.3, 1021.3.1, 1021.4)

Proponent: Wayne Jewell, Green Oak Township, representing self and Steve Thomas, Colorado Code Consulting, representing self

Revise as follows:

1015.2.2 (IFC [B] 1015.2.2) Three or more exits or exit access doorways. Where access to three or more *exits* is required, at least two *exit* doors or *exit access doorways* shall be arranged in accordance with the provisions of Section 1015.2.1. Additional required exit or exit access doorways shall be arranged a reasonable distance apart so that if one becomes, blocked, the others will be available.

SECTION 1021 (IFC [B] 1021)
NUMBER OF EXITS ~~AND EXIT CONFIGURATION~~

1021.1 (IFC [B] 1021.1) General. Each story and occupied roof shall have the minimum number of independent exits, or access to exits, as specified in ~~this section~~ Table 1021.1. A single exit or access to a single exit shall be permitted in accordance with Section 1021.2. The required number of exits, or exit access stairways or ramps providing access to exits, from any story shall be maintained until arrival at grade or a public way. ~~Exits or access to exits from any story shall be configured in accordance with this section. Each story above the second story of a building shall have a minimum of one interior or exterior exit stairway, or interior or exterior exit ramp. At each story above the second story that requires a minimum of three or more exits, or access to exits, a minimum of 50 percent of the required exits shall be interior or exterior exit stairways, or interior or exterior exit ramps.~~

~~Exceptions:~~

1. ~~Interior exit stairways and interior exit ramps are not required in open parking garages where the means of egress serves only the open parking garage.~~
2. ~~Interior exit stairways and interior exit ramps are not required in outdoor facilities where all portions of the means of egress are essentially open to the outside.~~

TABLE 1021.1 (IFC [B] TABLE 1021.1)
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

Occupant Load per Story	Minimum Number of Exits or Access to Exits From Story
1-500	2
501-1,000	3
More than 1,000	4

1021.2 (IFC [B] 1021.2) Single exits ~~from stories.~~ A single exit or access to a single exit shall be permitted ~~Two exits, or exit access stairways or ramps providing access to exits,~~ from any story or occupied roof, ~~shall be~~ provided ~~where~~ one of the following conditions exists:

1. The occupant load, ~~or~~ number of dwelling units and exit access travel distance does not

exceed~~s~~ ~~one of~~ the values in Table 1021.2(1) or 1021.2(2).

~~2. The exit access travel distance exceeds that specified in Table 1021.2(1) or 1021.2(2) as determined in accordance with the provisions of Section 1016.1.~~

~~3. Helistop landing areas located on buildings or structures shall be provided with two exits, or exit access stairways or ramps providing access to exits.~~

~~**Exceptions:**~~

~~1~~2. Rooms, areas and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit or access to a single exit.

~~2~~3. Group R-3 occupancy buildings shall be permitted to have one exit.

~~3~~4. Parking garages where vehicles are mechanically parked shall be permitted to have one exit or access to a single exit,

~~4. Air traffic control towers shall be provided with the minimum number of exits specified in Section 412.3.~~

~~5. Individual dwelling units in compliance with Section 1021.2.3.~~

5~~6.~~ Group R-3 and R-4 congregate residences shall be permitted to have one exit or access to a single exit.

6. ~~**1021.2.3 (IFC [B] 1021.2.3) Single-story or multi-story dwelling units.**~~ Individual single-story or multi-story dwelling units shall be permitted to have a single exit or access to a single exit ~~within and~~ from the dwelling unit provided that all of the following criteria are met:

   6.1 The dwelling unit complies with Section 1015.1 as a space with one means of egress and

   6.2 Either the exit from the dwelling unit discharges directly to the exterior at the level of exit discharge, or the exit access outside the dwelling unit's entrance door provides access to not less than two approved independent exits.

~~7. Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:~~

   ~~7.1 The number of exits from the entire story complies with Section 1021.2.4;~~

   ~~7.2 The access to exits from each individual space in the story complies with Section 1015.1; and~~

   ~~7.3 All spaces within each portion of a story shall have access to the minimum number of approved independent exits based on the occupant load of that portion of the story but not less than two exits.~~

TABLE 1021.2(1) (IFC [B] TABLE 1021.2(1))
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane	R-2[a, b]	4 dwelling units	125 feet
Fourth story above grade plane and higher ~~above~~	NP	NA	NA

For SI: 1 foot = 3048 mm.
NP – Not Permitted
NA – Not Applicable
a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
b. This Table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1021.2(2).

TABLE 1021.2(2) (IFC [B] TABLE 1021.2(2))
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANTS STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story above or below grade plane ~~basement~~	A, B[b], E F[b], M, U, S[b]	49 occupants	75 feet
	H-2, H-3	3 occupants	25 feet
	H-4, H-5, I, R-1, R-2[a,c], R-4	10 occupants	75 feet
	S	29 occupants	100 feet
Second story above grade plane	B, F, M, S	29 occupants	75 feet
Third story above grade plane and ~~above~~ higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP – Not Permitted
NA – Not Applicable
a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
c. This Table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1021.2(1).

1021.2.1 (IFC [B] 1021.2.1) Mixed occupancies. Where one exit, or exit access stairway or ramp providing access to exits at other stories, is permitted to serve individual stories, mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2(1) or Table 1021.2(2) for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. In each story of a mixed occupancy building, the maximum number of occupants served by a single exit shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants indicated in Table 1012.3(1) for each occupancy does not exceed one. Where dwelling units are located on a story with other occupancies, the actual number of dwelling units divided by 4 plus the ratio from the other occupancy does not exceed one.

1021.2.2 (IFC [B] 1021.2.2) Exits from specific space. Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:

1. The number of exits from the entire story complies with Section ~~1021.4.1~~ 1021.1;
2. The access to exits from each individual space in the story complies with Section 1015.1; and
3. All spaces within each portion of a story shall have access to the minimum number of approved independent exits based on the occupant load of that portion of the story but not less than two exits.

~~**1021.2.2 (IFC [B] 1021.1.2) Basements.** A basement provided with one exit shall not be located more than one story below grade plane.~~

~~**1021.2.3 (IFC [B] 1021.2.3) Single-story or multi-story dwelling units.** Individual single-story or multi-story dwelling units shall be permitted to have a single exit within and from the dwelling unit provided that all of the following criteria are met:~~

1. ~~The dwelling unit complies with Section 1015.1 as a space with one means of egress and~~
2. ~~Either the exit from the dwelling unit discharges directly to the exterior at the level of exit discharge, or the exit access outside the dwelling unit's entrance door provides access to not less~~

~~than two approved independent exits.~~

~~**1021.2.4 (IFC [B] 1021.2.4) Three or more exits.** Three exits, or exit access stairways or ramps providing access to exits at other stories, shall be provided from any story or occupied roof with an occupant load of 501-1,000. Four exits, or exit access stairways or ramps providing access to exits at other stories, shall be provided from any story or occupied roof with an occupant load greater than 1,000.~~

~~**1021.2.5 (IFC [B] 1021.2.5) Additional exits.** In buildings over 420 feet in height, additional exits shall be provided in accordance with Section 403.5.2.~~

~~**1021.3 (IFC [B] 1021.3) Exit configuration.** Exits, or exit access stairways or ramps providing access to exits at other stories, shall be arranged in accordance with the provisions of Section 1015.2 through 1015.2.2. Exits shall be continuous from the point of entry into the exit to the exit discharge.~~

~~**1021.3.1 (IFC [B] 1021.3.1) Access to exits at adjacent levels.** Access to exits at other levels shall be by stairways or ramps. Where access to exits occurs from adjacent building levels, the horizontal and vertical exit access travel distance to the closest exit shall not exceed that specified in Section 1016.1. Access to exits at other levels shall be from an adjacent story.~~

> ~~**Exception:** Landing platforms or roof areas for helistops that are less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m^2) in area, shall be permitted to access the second exit by a fire escape, alternating tread device or ladder leading to the story or level below.~~

<u>1021.3</u> ~~1021.4~~ (IFC [B] <u>1021.3</u> ~~1021.4~~) Vehicular ramps. Vehicular ramps shall not be considered as an exit access ramp unless pedestrian facilities are provided.

Reason: The intent of this proposal is to reorganize Section 1020 for clarity.

1015.2.2 – Separation for the 3rd exit was deleted by E82-04/05 as too subjective, however, this language should be reinserted because now there is no language to describe where additional exits are located.
1021.1 –The word 'independent' is added for clarity (no one should consider a double door as two exits). The minimum number of MOE have been moved into a table format for clarity and ease of reference for other requirements. The exceptions are not needed since the number required is based on exit and/or access to exits. Open parking and outdoor stadiums are exit access stairways from each floor above grade.
New Table 1021.1 – Requirements from 1021.1 and 1021.2.4 are relocated together into Table format. Allowances are extended to be number of exits and/or number of access to exits (i.e., exit access doorways, exit access stairways, exit access ramps).
1021.2 – This section is revise for a positive where permitted approach rather than exceptions.

- Item 1 & 2 – combined
- Existing item 3 – deleted because already addressed in 412.7.3 – need to be consistent in references for MOE
- New Item 2 and 4 – revised for exit and exit access
- Existing Exception 4 – deleted because already addressed in 412.3 - need to be consistent in references for MOE
- Existing Exception 5 - addressed in new Item 6
- New Item 5 - revised for exit and exit access
- New Item 6 – revised for exit and exit access; relocated from 1021.2.3. No reason to be separate section.
- Existing Exception 7 – Since this is exit configuration, not single exit, it has been relocated to new 1021.2.2.

Table 1021.2(1) and 1021.2(2) – Revise headings to limit number of basements to 1.
1021.2.1 – The additional sentence adopts the same ratio formula currently in the code but addresses what you would do when dwelling units were in the mix (i.e., there is no occupant load).
New 1021.2.2 – this was Section 1021.2 Exception 7. Relocated since this is exit configuration for situations where one exit may be within a tenant space and blocked from access from other tenants on the floor.
Existing 1021.2.2 - Deleted. Basements are now addressed in Table 1021.2(1) and 1021.2(2) so not needed here.
Existing 1021.2.3 – deleted and relocated to 1021.2 new Item 6.
Existing 1021.2.4 – deleted and relocated to Table 1021.1
Existing 1021.2.5 – deleted –3rd stairway is not a required means of egress stairway and already addressed in 403.5.2. Code users should either reference all MOE in Chapter 4 or rely on Chapter 4 and not reference anything.
Existing 1021.3 - Delete. Now addressed in 1015.2 and 1015.2.1
Existing 1021.3.1 - Delete. Now addressed in 1015.2 and 1015.2.1. Helistops in exception are addressed in 412.7.3.

Cost Impact: None

E127-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1020-E- Jewell-Thomas.doc

E128– 12
1021.1 (IFC [B] 1021.1)

Proponent: Philip Brazil, P.E., Senior Engineer, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee

Revise as follows:

1021.1 (IFC [B] 1021.1) General. Each story and occupied roof shall have the minimum number of *exits*, or access to *exits*, as specified in this section. The required number of exits, or *exit access stairways* or *ramps* providing access to exits, from any story <u>or occupied roof</u> shall be maintained until arrival at grade or a *public way*. *Exits* or access to exits from any story <u>or occupied roof</u> shall be configured in accordance with this section. Each story <u>and occupied roof</u> above the second story of a building shall have a minimum of one interior or exterior *exit stairway*, or interior or exterior *exit ramp*. At each story <u>and occupied roof</u> above the second *story* that requires a minimum of three or more *exits*, or access to *exits*, a minimum of 50 percent of the required *exits* shall be interior or exterior *exit stairways*, or interior or exterior *exit ramps*.

Exceptions:

1. *Interior exit stairways* and *interior exit ramps* are not required in *open parking garages* where the *means of egress* serves only the *open parking garage*.
2. *Interior exit stairways* and *interior exit ramps* are not required in outdoor facilities where all portions of the *means of egress* are essentially open to the outside.

Reason: The addition of "or occupied roof" clarifies the intent from the first sentence ("each story and occupied roof") that occupied roofs shall be provided with exits as required for stories. Without the addition of "or occupied roof," the requirements to (1) maintain the required number of exits, or exit access stairways or ramps providing access to exits, until arrival at grade or a public way, (2) configure the exits or access to exits in accordance with Section 1021, and (3) have a minimum number of interior or exterior exit stairways or ramps, will not apply to occupied roofs. The additions are also for consistency with "story or occupied roof" in Sections 1021.2 and 1021.2.4.

Finally, the addition of "or occupied roof" will restore the intent of Section 1021.1 in the 2009 IBC, which required occupied roofs to "be provided with exits as required for stories."

Cost Impact: The code change proposal will not increase the cost of construction.

E128-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.1-E-Brazil.doc

E129 – 12
1021.1 (IFC [B] 1021.1)

Proponent: Paul Armstrong, P.E., CBO, City of El Monte representing the ICC Orange Empire Chapter Code Committee (paul@jaspacific.com)

Revise as follows:

1021.1 (IFC [B] 1021.1) General. Each story and occupied roof shall have the minimum number of exits, or access to exits, as specified in this section. The required number of exits, or exit access stairways or ramps providing access to exits, from any story shall be maintained until arrival at grade or a public way. Exits or access to exits from any story shall be configured in accordance with this section. A minimum of 50 percent of the required exits from ~~E~~each story above the second story of a building shall be an ~~have a minimum of one~~ interior or exterior exit stairway~~,~~ or ~~interior or exterior~~ exit ramp. ~~At each story above the second story that requires a minimum of three or more exits, or access to exits, a minimum of 50 percent of the required exits shall be interior or exterior exit stairways, or interior or exterior exit ramps.~~

Exceptions:

1. *Interior exit stairways* and *interior exit ramps* are not required in *open parking garages* where the *means of egress* serves only the *open parking garage*.
2. *Interior exit stairways* and *interior exit ramp*s are not required in outdoor facilities where all portions of the *means of egress* are essentially open to the outside.

Reason: The current provision is confusing. This is intended to make the requirement much clearer.

Cost Impact: The code change proposal will not increase the cost of construction.

E129-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.1-E-Armstrong.doc

E130 – 12
1021.1 (IFC [B] 1021.1)

Proponent: David S. Collins, The PREVIEW GROUP, Inc., representing The American Institute of Architects (dcollins@preview-group.com); Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

1021.1 (IFC [B] 1021.1) General. Each story and occupied roof shall have the minimum number of exits, or access to exits, as specified in this section. The required number of exits, or exit access stairways or ramps providing access to exits, from any story shall be maintained until arrival at grade or a public way. Exits or access to exits from any story shall be configured in accordance with this section. ~~Each story above the second story of a building shall have a minimum of one interior or exterior exit stairway, or interior or exterior exit ramp. Each story above the second story that requires a minimum of three or more exits, or access to exits, a minimum of 50 percent of the required exits shall be interior or exterior exit stairways, or interior or exterior exit ramps.~~

~~**Exceptions:**~~

1. ~~Interior exit stairways and interior exit ramps are not required in open parking garages where the means of egress serves only the open parking garage.~~
2. ~~Interior exit stairways and interior exit ramps are not required in outdoor facilities where all portions of the means of egress are essentially open to the outside.~~

Reason: The purpose of Section 1021 is to specify how many exits or access to exits are required from a given story. Currently, Section 1021 also contains a requirement that mandates that specific exit components (interior or exterior exit stairways or ramps) be included in the design of any building above the second story. This prescriptive requirement is contrary to the IBC means of egress philosophy clarified in the 2012 Edition. The architect's design should dictate what exit components are used and where, so long as they satisfy the applicable means of egress design requirements.

This proposal is intended to complete a concept introduced into the 2012 IBC by code change proposal E5-09/10. That proposal eliminated the term “exit enclosure” and replaced it with the term “interior exit stairway.” The entire methodology of means of egress stairway relationships was examined and placed in technical context. A major feature of this reorganization was to specify that there were no exceptions to interior exit stairway enclosure requirements. Section 1022.1 of the 2009 Edition of the IBC contained seven exceptions to fire-resistance rated exit stairway requirements. Section 1016.1 contained an additional two related exceptions. The current logic is that once an exit component is required to satisfy a given means of egress design requirement, it should be properly protected and maintained until arrival at the exit discharge or public way.

One residual requirement exists from the former collection of exceptions to the enclosure of exits. That provision is contained in the last two sentences of Section 1021.1 and mandates that above the second story, there shall be a minimum of one (or 50%) interior or exterior exit stairway or interior or exterior exit ramp. Bear in mind, the provision is not addressing the number of required exits from the story—the subject of the section. Rather, it is prescribing specific exit components to be utilized at a given story. The definition of “INTERIOR EXIT STAIRWAY” states that it is, “An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.” As noted in the definition, interior exit stairways serve to meet means of egress design requirements. Specific exit components are to be employed by the building designer as necessary to satisfy fundamental design provisions such as exit access travel distance. Typically, but not necessarily, interior exit stairways will be used at the upper levels of a building. There is no technical or philosophical reason to mandate a particular exit component where the story otherwise meets all means of egress design requirements.

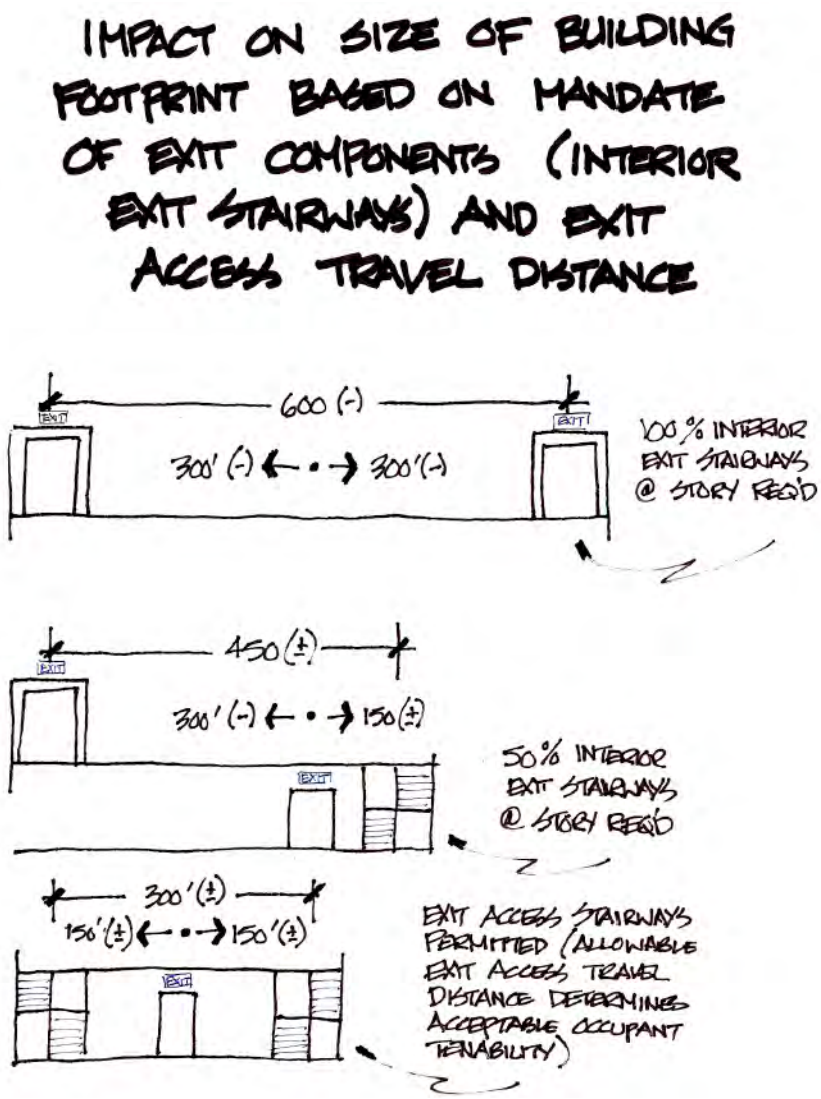
Interestingly, no legacy code contained such a requirement. The related technical provision in the 2009 IBC was located at Section 1016.1, Exception 3 that states, “In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps when connecting a maximum of two stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.” An exception that did not specifically mention interior exit stairways, somehow evolved into a requirement that demanded the inclusion of specific exit components.

In combination, IBC means of egress design requirements provide for an extremely high degree of occupant tenability. There is no technical, historical or statistical justification for the prescriptive requirement for specific exit components above the second story of a building, regardless of how small that the building is. In fact, requiring interior or exterior stairways has the effect of enlarging the exit access at a given story. Section 1021.3.1 states, “Where access to exits occurs from adjacent building levels, the horizontal and vertical exit access travel distance to the closest exit shall not exceed that specified in Section 1016.1.” Section 1016.3.1 further states, “Travel distance on exit access stairways or ramps shall be included in the exit access travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings.” Accordingly, the exit access includes that portion of travel distance at the upper story, the exit access stairway and travel to a formal exit at the story below. The requirement to include all travel until arrival at the entrance to an exit at an adjacent level reduces the building footprint (See illustration.)

The size of the building and the design of the means of egress system should be based on the vision of the architect. Mandating specific exit components at upper building levels can reduce flexibility in the design of the means of egress system and the building overall.

The two current exceptions to Section 1021.1 are unnecessary when the interior and exterior stairway and ramp provisions are deleted. Section 1009.3, Exceptions 6 and 7 allow for unenclosed exit access stairways in open parking garages and outdoor facilities. Additionally, Section 1016.3, Exceptions 1 and 2 allow for exit access travel distance to be measured to an unenclosed exit access stairway or ramp in open parking garages and outdoor facilities.

In summary, the current requirement in Section 1021.1 for each story above the second story to have at least one interior or exterior exit stairway or interior or exterior exit ramp is the last remnant of a former disjointed IBC means of egress design approach based on philosophically conflicting legacy code provisions. With the 2012 Edition of the IBC, design integrity and consistency in interpretation has finally been achieved through the clarification of exit stairway enclosure and exit access from adjacent stories provisions--with one exception. Deletion of the mandate for specific exit components above the second story of a building will allow the design of the means of egress to be properly based on stated Chapter 10 design requirements, including exit access travel distance, numbers of exits or exit access doorways, separation of exits or exit access doorways, etc. Approval of this proposal will complement the performance-based nature of IBC means of egress design provisions while maintaining the highest levels of occupant safety.



Cost Impact: None

E130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.1-E-Collins-Keith.doc

E131 – 12

1021.1, Table 1021.2(1), Table 1021.2(2) [IFC [B] 1021.1, Table 1021.2(1), Table 1021.2(2)]

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

1021.1 (IFC [B] 1021.1) General. Each story and occupied roof shall have the minimum number of *exits*, or access to exits, as specified in this section. The required number of *exits*, or *exit access stairways* or *ramps* providing access to exits, from any story shall be maintained until arrival at grade or a *public way*. *Exits* or access to exits from any story shall be configured in accordance with this section. Each story ~~above the second story of a building~~ located more than two stories above the lowest level of exit discharge shall have a minimum of one interior or exterior *exit stairway*, or interior or exterior *exit ramp*. At each story ~~above the second story~~ located more than two stories above the lowest level of exit discharge that requires a minimum of three or more *exits*, or access to *exits*, a minimum of 50 percent of the required *exits* shall be interior or exterior *exit stairways*, or interior or exterior *exit ramps*.

Exceptions:

1. Interior exit stairways and interior exit ramps are not required in open parking garages where the means of egress serves only the open parking garage.
2. Interior exit stairways and interior exit ramps are not required in outdoor facilities where all portions of the means of egress are essentially open to the outside.

TABLE 1021.2(1) (IFC [B] TABLE 1021.2(1))
STORIES[a] WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story	R-2[~~a,~~ b, c]	4 dwelling units	125 feet
Fourth story and above	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP – Not Permitted
NA – Not Applicable
a. When determining the number of "stories", the level of exit discharge shall be considered the first story.
b. Buildings classified as Group R-2 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with *emergency escape and rescue openings* in accordance with Section 1029.
~~b~~ c. This table is used for R-2 occupancies consisting of *dwelling units*. For R-2 occupancies consisting of *sleeping units*, use Table 1021.2(2).

TABLE 1021.2(2) (IFC [B] TABLE 1021.2(2))
STORIES[a] WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANTS PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story or basement	A, B[~~b~~c], E, F[~~b~~c], M, U, S[~~b~~c]	49 occupants	75 feet
	H-2, H-3	3 occupants	25 feet
	H-4, H-5, I, R-1, R-2[~~a~~ b, ~~c~~ d], R-4	10 occupants	75 feet
	S	29 occupants	100 feet
Second story	B, F, M, S	29 occupants	75 feet
Third story and above	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP – Not Permitted
NA – Not Applicable

a. When determining the number of "stories", the level of exit discharge shall be considered the first story.
b. Buildings classified as Group R-2 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with *emergency escape and rescue openings* in accordance with Section 1029.
~~b~~ c. Group B, F and S occupancies in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
~~c~~ d. This table is used for R-2 occupancies consisting of *sleeping units*. For R-2 occupancies consisting of *dwelling units*, use Table 1021.2(1).

Reason: This proposal substitutes level of exit discharge as the basis for requiring exit stairways and ramps. The level of exit discharge is the most pertinent datum to trigger egress requirements that pertain to the location of a story in a building. The reason for specifying different egress requirements for stories located at different elevations is access to the exit discharge, i.e., how many stories must be traversed before reaching the exit discharge. Using level of exit discharge also provides more consistency among buildings because the location of the second story can vary greatly between buildings. Basements are defined as stories, so the second story of a building could be below grade. In buildings without a basement, the second story could be some distance above grade. The proposal specifies the lowest level of exit discharge to address buildings on sloping sites with more than one level of exit discharge. The lowest level of exit discharge is the most conservative interpretation of the intent of this section.

Cost Impact: The code change proposal will not increase the cost of construction.

E131-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.1-E-Traxler.doc

E132 – 12
1021.2 (IFC [B] 1021.2)

Proponent: Philip Brazil, P.E., Senior Engineer, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1021.2 (IFC [B] 1021.2) Exits from stories. Two *exits*, or *exit access stairways* or *ramps* providing access to *exits*, from any story or occupied roof shall be provided where one of the following conditions exists:

1. The *occupant load* or number of *dwelling units* exceeds one of the values in Table 1021.2(1) or 1021.2(2).
2. The *exit access* travel distance exceeds that specified in Table 1021.2(1) or 1021.2(2) as determined in accordance with the provisions of Section 1016.1.
3. *Helistop* landing areas located on buildings or structures shall be provided with two *exits*, or *exit access stairways* or *ramps* providing access to *exits*.

Exceptions:

1. Rooms, areas and spaces complying with Section 1015.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*~~,~~ are permitted to have one *exit*.
2. Group R-3 occupancy *buildings* shall be permitted to have one *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit*.
4. Air traffic control towers shall be provided with the minimum number of *exits* specified in Section 412.3.
5. Individual *dwelling units* in compliance with Section 1021.2.3.
6. ~~6. Group R-3 and R-4 congregate residences shall be permitted to have one *exit*.~~

6.~~7.~~ *Exits* serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:

- 6.1.~~7.1.~~ The number of *exits* from the entire story complies with Section 1021.2.4;
- 6.2.~~7.2.~~ The access to *exits* from each individual space in the story complies with Section 1015.1; and
- 6.3.~~7.3.~~ All spaces within each portion of a story shall have access to the minimum number of *approved* independent *exits* based on the *occupant load* of that portion of the story, but not less than two exits.

Reason: Exception #6 was added by Proposal E5-09/10 but a reason for the exception was not given in the reason statement accompanying the proposal and there is no corresponding provision in the 2009 IBC. Note that the deletion has no effect on Group R-3 occupancies in that are permitted to have one exit by Exception #2.

Cost Impact: The code change proposal will not increase the cost of construction.

E132-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.2-E-Brazil.doc

E133 – 12
1021.2, 1021.2.4 (IFC [B] 1021.2, 1021.2.4)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1021.2 (IFC [B] 1021.2) Exits from stories. Not less than two *exits*, or *exit access stairways* or *ramps* providing access to *exits*, shall be provided from any occupied portion of a story or occupied roof ~~shall be provided~~ where one of the following conditions exists:

1. The *occupant load* or number of *dwelling units* exceeds one of the values in Table 1021.2(1) or 1021.2(2).
2. The *exit access* travel distance exceeds that specified in Table 1021.2(1) or 1021.2(2) as determined in accordance with the provisions of Section 1016.1.
3. *Helistop* landing areas located on buildings or structures shall be provided with two *exits*, or *exit access stairways* or *ramps* providing access to exits.

Exceptions:

1. Rooms, areas and spaces complying with Section 1015.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit*.
2. Group R-3 occupancy buildings shall be permitted to have one *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit*.
4. Air traffic control towers shall be provided with the minimum number of *exits* specified in Section 412.3.
5. Individual *dwelling units* in compliance with Section 1021.2.3.
6. Group R-3 and R-4 congregate residences shall be permitted to have one *exit*.
7. ~~*Exits* serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:~~
   ~~7.1. The number of *exits* from the entire story complies with Section 1021.2.4;~~
   ~~7.2 . The access to *exits* from each individual space in the story complies with Section 1015.1; and~~
   ~~7.3. All spaces within each portion of a story shall have access to the minimum number of *approved* independent *exits* based on the *occupant load* of that portion of the story, but not less than two exits.~~

1021.2.4 (IFC [B] 1021.2.4) Three or more exits. Three *exits*, or *exit access stairways* or *ramps* providing access to *exits* at other stories, shall be provided from any portion of a story or occupied roof with an *occupant load* from 501 to and including 1,000. Four *exits*, or *exit access stairways* or *ramps* providing access to *exits* at other stories, shall be provided from any portion of a story or occupied roof with an *occupant load* greater than 1,000.

Reason: Exception 7 was proposed by the proponent of this code change as E120-09/10 and was an exception offering relief from the newly changed requirement found in the 2009 IBC: "All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1021.1 based on the occupant load of the story." That provision in the 2009 IBC created problems when one of the required exits from a story was located in a portion of the story exclusively occupied by a large tenant thus prohibiting access to a third or fourth exit to the story by other smaller tenant areas. E120-09/10 was approved as submitted. When E5-09/10 also was approved it deleted the requirement in quotes above. The proponents of E5-09/10 relied on basic principles of egress to ensure all required exit access doors from spaces would have access to the minimum required number of independent exits however no specific requirement appeared in E-5-09/10. It appears exception 7 may have been used out of context by the Correlation Committee as a bandaid for this requirement.

A separate code change is offered this cycle requiring exit access doors from spaces to lead to separate exits in order to be considered as contributing to the total number of exits or exit access doorways required by Section 1015.1. Assuming this change passes and with the revised language proposed for Sections 1021.2 and 1021.2.4 contained in this proposal, exception 7, which is out of context, is no longer needed to ensure all spaces have access to the minimum number of *exits* or *exit access doors.*

Cost Impact: This code change will not increase the cost of construction.

E133-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.2-E-Richardson.doc

E134– 12
Table 1021.2(2), (IFC [B] Table 1021.2(2))

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com); Maureen Traxler, representing City of Seattle Department of Planning and Development (maureen.traxler@seattle.gov)

Revise as follows:

TABLE 1021.2(2) (IFC [B] 1021.2(2))
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANTS PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story or basement	A, B[b], E F[b], M, U, ~~S[b]~~	49 occupants	75 feet
	H-2, H-3	3 occupants	25 feet
	H-4, H-5, I, R-1, R-2[a,c], R-4	10 occupants	75 feet
	S[b,d]	29 occupants	~~100~~ 75 feet
Second story	B, F, M, S[d]	29 occupants	75 feet
Third story and above	NP	NA	NA

For SI: 1 foot = 304.8 mm.
NP – Not Permitted
NA – Not Applicable

a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
c. This Table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1021.2(1).
d. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet (30 480 mm).

Reason: Table 1021.2(2) currently contains a technical conflict. That is, within the “First story or basement” line, Group S occupancies are listed twice with differing occupant load and exit access travel distance thresholds. Rather than arbitrarily selecting one of the two sets of values, they have been adjusted so as to coincide with the requirements for multiple exits or exit access doorways from spaces. Table 1015.1 allows for single exits/exit access in Group S occupancies where the occupant load is 29 or less. Table 1014.3 limits the common path of egress travel in Group S occupancies to 75 feet in unsprinklered buildings and 100 feet in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Additionally, Table 1014.3, Footnote d permits 100 feet for common path of egress travel in Group S-2 open parking garages. The proposed corrections to Table 1021.2(2) eliminate internal conflicts and are consistent with multiple exit thresholds found elsewhere in the IBC.

Cost Impact: None

E134-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1021.1(2)-E-Keith-Traxler.doc

E135 – 12
1021.2.1 (IFC [B] 1021.2.1)

Proponent: Steve Pfeiffer representing City of Seattle, Department of Planning & Development (steve.pfeiffer@seattle.gov)

Revise as follows:

1021.2.1 (IFC [B] 1021.2.1) Mixed occupancies. Where one exit, or exit access stairway or ramp providing access to exits at other stories, is permitted to serve individual stories, mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2(1) or Table 1021.2(2) for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

In each story of a mixed occupancy building, the maximum number of occupants served by a single exit shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants for each occupancy does not exceed one.

In each story containing both Group R-2 dwelling units and other occupancies, the maximum number of dwelling units and occupants served by a single exit shall be such that the sum of the ratios of the actual number of dwelling units divided by 4, plus the calculated number of occupants of the rest of the story, divided by the allowable number of occupants for each occupancy, does not exceed one.

Reason: This change allows use of the "unity" formula when a story contains both dwelling units and some other occupancy. For example, a second story would be permitted to be served by a single exit if it contained one dwelling unit and an office with an occupant of 21 or fewer (1/4 + 21/29 =0.974 ≤1). Or, a second story could contain three dwellings and an office with an occupant load of 7 or fewer, yet still be served by a single exit (3/4 + 7/29 =0.991 ≤1). The first paragraph of this section requires each occupancy to comply with the travel distance requirements in the table.

Cost Impact: The code change proposal will not increase the cost of construction.

E135-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.2.1-E-Pfeiffer.doc

E136 – 12
1021.3.1 (IFC [B] 1021.3.1)

Proponent: Jonathan Siu, City of Seattle Dept of Planning & Development representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov)

Revise as follows:

1021.3.1 (IFC [B] 1021.3.1) Access to exits at adjacent levels. Access to exits at other levels shall be by stairways or ramps. Where access to exits occurs from adjacent building levels, the horizontal and vertical exit access travel distance to the closest exit shall not exceed that specified in Section 1016.1. ~~Access to exits at other levels shall be from an adjacent story.~~ <u>The path of egress travel to an *exit* shall not pass through more than one adjacent story.</u>

Reason: This proposal is intended to clarify the requirement for exit accesses leading to an exit that is located on another story. The intent of the last sentence in Section 1021.3.1 is to prohibit having an occupant travel more than one story via an exit access stairway or ramp to reach an exit. However, as written, the language is confusing and can be read to say that all exits <u>must</u> be accessed from an adjacent story. We believe the requirement can be stated more clearly as we have proposed.

Cost Impact: The code change proposal will not increase the cost of construction.

E136-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1021.3.1-E-Siu.doc

E137 – 12
1022.1(IFC [B] 1022.1)

Proponent: Paul Armstrong, P.E., CBO, City of El Monte representing the ICC Orange Empire Chapter Code Committee (paul@jaspacific.com)

Revise as follows:

1022.1 (IFC [B] 1022.1) General. Interior exit stairways and interior exit ramps serving as an exit component in a means of egress system shall comply with the requirements of this section. Interior exit stairways and ramps shall <u>be enclosed and</u> lead directly to the exterior of the building or shall be extended to the exterior of the building with an extended exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An interior exit stairway or ramp shall not be used for any purpose other than as a means of egress.

Reason: Editorial revision. The proposed revision is added for clarification to the requirement for protection of interior exit stairways or ramps as found in Chapter 2, Definitions.

Cost Impact: The code change proposal will not increase the cost of construction.

E137-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.1-E-Armstrong.doc

E138 – 12
1022.1, 1023.1 (IFC [B] 1022.1, 1023.1)

Proponent: Lee J. Kranz, City of Bellevue, Washington, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

Revise as follows:

1022.1 (IFC [B] 1022.1) General *Interior exit stairways* and *interior exit ramps* serving as an *exit* component in a *means of egress system* shall comply with the requirements of this section. *Interior exit stairways* and *ramps* shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an *exit passageway* conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An *interior exit stairway* or *ramp* shall not be used for any purpose other than as a means of egress <u>and a circulation path</u>.

<u>**Exception**: An interior exit stairway or ramp shall be permitted to be used as a circulation path.</u>

1023.1 (IFC [B] 1023.1) General E*xit passageways* serving as an *exit* component in a *means of egress system* shall comply with the requirements of this section. An *exit passageway* shall not be used for any purpose other than as a means of egress <u>and a circulation path</u>.

<u>**Exception**: An interior exit passageway shall be permitted to be used as a circulation path.</u>

Reasoning: Although the code text, as currently written, does not specifically prohibit interior exit stairways, ramps and exit passageways from being used as a circulation path or as a path of entry into a building, it could be interpreted that way. Interior exit stairways, ramps and passageways are commonly used by building occupants to access other floors or areas on the same floor for convenience purposes.

According to official IBC Interpretation 27-08 ~~(see attached copy)~~ issued on March 6' 2009 by ICC staff "An exit passageway provides a protected path of egress travel in a horizontal direction to the exit discharge or the public way. While this provision states that the exit passageway shall not be used for any purpose other than as a means of egress, similar to an exit enclosure, the intent is to limit openings to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway in addition to prohibiting the exit passageway from being used for storage or the placement of furniture, vending machines, etc., because these situations may obstruct the path of exit travel and, if the materials are combustible, create a life safety hazard. The code does not specifically prohibit the exit passageway from also being used as a path of entry into a building."

The proposed exception to Section 1022.1 for interior exit stairways and ramps and to Section 1023.1 for exit passageways will add clarity on this issue and will not diminish life safety for the means of egress. Note: the term "Circulation path" is defined in IBC Chapter 2.

Cost Impact: None

E138-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.1-E-KRANZ

E139 – 12
1022.2 (IFC [B] 1022.2)

Proponent: David S. Collins, FAIA, The Preview Group, Inc. representing The American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

1022.2 (IFC [B] 1022.2) Construction. Enclosures for interior exit stairways and ramps shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Interior exit stairway and ramp enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit stairways or ramps shall include any basements, but not any mezzanines. Interior exit stairways and ramps shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.

Exceptions:

1. Interior exit stairways and ramps in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.
2. Interior exit stairways within an atrium enclosed in accordance with Section 404.6.

Reason: Section 1022.2 requires an enclosure of an interior exit stair by a 1 hour or 2 hour passive enclosure. Section 1022.1 limits the use of the enclosure to only egress purposes. Section 404 for atriums requires that the space be enclosed by a 1-hour passive enclosure and also protected by various active systems including fire suppression and smoke control features. The natural configuration of an atrium affords building occupants with immediate views of the entire egress to the bottom of the atrium.

In addition to immediate additional life safety of the occupants because of the openness, there are ancillary health benefits for building occupants to safely use the stairs to traverse from one level to another even when the stair is not being used in an emergency.

Cost Impact: The use of the atrium as an exit stair will reduce the cost of construction.

E139-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.2-E-Collins.doc

E140 – 12
1022.3 (IFC [B] 1022.3)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1022.3 (IFC [B] 1022.3) Termination. *Interior exit stairways* and *ramps* shall terminate at an *exit discharge* or a *public way*.

> **Exception:** ~~*Interior exit stairways* and *ramps* shall be permitted to terminate at an *exit passageway* complying with Section 1023, provided the *exit passageway* terminates at an *exit discharge* or a *public way*.~~ A combination of interior exit stairways, interior exit ramps and exit passageways, constructed in accordance with Sections 1022.2, 1022.3.1 and 1023 and forming a continuous protected enclosure, shall be permitted to extend an interior exit stairway or ramp to the exit discharge or a public way.

Reason: Current language requires interior exit stairways and ramps (formerly exit enclosures) to lead directly to the exterior of the building or shall be extended by an exit passageway to the exterior of the building. This change would allow a combination of interior exit stairs, ramps, and passageways to from a continuous protected enclosure to the exterior of a building. It is practice to utilize exit passageways and ramps as required to extend or connect the exit enclosure protection horizontally at building offsets and other obstructions until the stairway can then again proceed downward ultimately terminating at a discharge or being extended to the discharge. The code language does not appear to recognize this practice although the 2012 IBC Code and Commentary, Figure 1011.1 gives this example to illustrate exit signs within an exit enclosure.

Cost Impact: This code change will not increase the cost of construction.

E140-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.3-E-Richardson.doc

E141 – 12
1022.3.1 (IFC [B] 1022.3.1)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1022.3.1 (IFC [B] 1022.3.1) Extension. Where *interior exit stairways* and *ramps* are extended to an *exit discharge* or a *public way* by an *exit passageway*, the *interior exit stairway* and *ramp* shall be separated from the *exit passageway* by a *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be at least equal to that required for the *interior exit stairway* and *ramp*. A *fire door* assembly complying with Section 716.5 shall be installed in the *fire barrier* to provide a *means of egress* from the *interior exit stairwa*y and *ramp* to the *exit passageway*. Openings in the *fire barrier* other than the *fire door* assembly are prohibited. Penetrations of the *fire barrier* are prohibited.

~~Exception~~ Exceptions:

1. Penetrations of the *fire barrier* in accordance with Section 1022.5 shall be permitted.
2. Separation between an interior exit stairway or ramp and the exit passageway shall not be required if there are no openings or penetrations in the exit passageway.

Reason: It is practice to utilize exit passageways and ramps as required to extend or connect the exit enclosure protection horizontally at building offsets and other obstructions until the stairway can then again proceed downward ultimately terminating at a discharge or being extended to the discharge. The purpose in having a door at this interface in the existing requirement is to prevent smoke from a possible open door or other penetration in the passageway from traveling up the exit enclosure. This is prevented if there are no openings or penetrations in the exit passageway. The exit passageway is constructed strictly as an extension of the enclosure at a horizontal offset. Egress can proceed faster if there are not intermediate doors contained at the enclosure transitions.

Cost Impact: This code change will not increase the cost of construction.

E141-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.3.1-E-Richardson.doc

E142 – 12
1022.3.1 (IFC [B] 1022.3.1)

Proponent: Ray Grill, P.E., Arup, representing self (Ray.Grill@arupgp.com)

Delete without substitution:

~~**1022.3.1 (IFC [B] 1022.3.1) Extension.** Where *interior exit stairways* and *ramps* are extended to an *exit discharge* or a *public way* by an *exit passageway*, the *interior exit stairway* and *ramp* shall be separated from the *exit passageway* by a *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 711, or both. The *fire-resistance rating* shall be at least equal to that required for the *interior exit stairway* and *ramp*. A *fire door* assembly complying with Section 716.5 shall be installed in the *fire barrier* to provide a *means of egress* from the *interior exit stairway* and *ramp* to the *exit passageway*. Openings in the *fire barrier* other than the *fire door* assembly are prohibited. Penetrations of the *fire barrier* are prohibited.~~

~~**Exception:** Penetrations of the *fire barrier* in accordance with Section 1022.5 shall be permitted.~~

Reason: The requirement for a door between an exit enclosure and an exit passageway creates a restriction to occupant movement during emergency egress. An exit passageway has the same basic requirements as an exit enclosure and therefore does not present a hazard to the exit enclosure. There was no technical argument for requiring it when it was first introduced in the 2009 edition of the code.

The code allows an exception for the fire rated separation and door between an exit enclosure and an exit passageway when stair pressurization is provided that includes pressurization of the passageway. If an exit is pressurized and there is an exit passageway as part of the stair, the passageway is required to be pressurized.

There is a companion code change to address the pressurized exit enclosure used with a passageway.

Cost Impact: None

E142-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.3.1-E-Grill.doc

E143– 12
1022.5, 1023.5, 1023.6 (IFC [B] 1022.5, 1023.5, 1023.6)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company (grkeith@mac.com)

Revise as follows:

1022.5 (IFC [B] 1022.5) Penetrations. Penetrations into ~~and openings~~ or through interior exit stairways and ramps are prohibited except for ~~required exit doors,~~ equipment and ductwork necessary for independent ventilation or pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication systems and electrical raceway serving the interior exit stairway and ramp and terminating at a steel box not exceeding 16 square inches (0.010 m^2). Such penetrations shall be protected in accordance with Section 713. There shall be no penetrations or communication openings, whether protected or not, between adjacent interior exit stairways and ramps.

> **Exception:** Membrane penetrations shall be permitted on the outside of the interior exit stairway and ramp. Such penetrations shall be protected in accordance with Section 713.3.2.

1023.5 (IFC [B] 1023.5) Openings ~~and penetrations.~~ Exit passageway opening protectives shall be in accordance with the requirements of Section 716.

Except as permitted in Section 402.8.7, openings in exit passageways other than unprotected exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where an interior exit stairway or ramp is extended to an exit discharge or a public way by an exit passageway, the exit passageway shall also comply with Section 1022.3.1.

Elevators shall not open into an exit passageway.

1023.6 (IFC [B] 1023.6) Penetrations. Penetrations into ~~and openings~~ or through an exit passageway are prohibited except for ~~required exit doors~~, equipment and ductwork necessary for independent pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication and electrical raceway serving the exit passageway and terminating at a steel box not exceeding 16 square inches (0.010m^2). Such penetrations shall be protected in accordance with Section 714. There shall be no penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

> **Exception:** Membrane penetrations shall be permitted on the outside of the exit passageway. Such penetrations shall be protected in accordance with Section 714.3.2.

Reason: Section 1022 subsection titles were revised for 2012. Section 1022.4 is re-titled, "Openings." Formerly, the section was titled "Openings and penetrations" in the 2009 Edition of the IBC although former Section 1022.4 (current section 1022.5) was titled "Penetrations." It is consistent with many IBC sections to distinguish between provisions applicable to openings and penetrations.

Although the section titles were corrected, the provisions contained within the sections were not. This proposal removes the references to opening protection requirements from Section 1022.5. There is no need to relocate them since Section 1022.4 already addresses identical interior exit stairway and ramp door limitations. Approval of this proposal will create editorial consistency in IBC opening and penetration protection requirements.

The proposed changes to Section 1023.5 is for consistency between exit stairway or ramp requirements and exit passageway requirements.

Cost Impact: None

E143-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.5-E-Keith.doc

E144-12
1022.10(New); [IFC [B] 1022.10 (New)]

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Add new text as follows:

1022.10 (IFC [B] 1022.10) Elevator Lobby identification signs. At landings in interior exit stairways where two or more doors lead to the floor level, the door leading to the elevator lobby shall be identified by signage located on the door or directly adjacent to the door stating "Elevator Lobby." Signage shall be in accordance with Section 1022.9.1 Items 4, 5 and 6.

(Renumber subsequent sections)

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is one of several proposals submitted by the CTC Elevator lobby SG. The ICC Executive Board directed the Code Technology Committee (CTC) to study the issue of elevator lobby separations in November 2010 due to the number of code change proposals submitted addressing this issue over a number of code change cycles. The Code Technology Committee formed a study group on the elevator lobby separation issue in December 2010. Note that this subject had been previously addressed by CABO/BCMC in 1986 with a similar conclusion. The code change proposals submitted are the result of the CTC's study of the issue. Note that the scope of the activity was as follows:

Scope

- Review the need for elevator lobbies**,** with emphasis on building use, building and hoistway height, active and passive fire protection features associated with the aforementioned.
- Review the differences and specific needs when dealing with elevator lobbies of traditional-use elevators, fire service elevators, and occupant evacuation elevators.
- Review related code provisions, such as egress from and through elevator lobbies.
- Review the appropriate use of alternatives including pressurization of hoistways, additional doors, roll-down style barriers, and gasketing systems.
- Review with members of elevator industry to scope the requirements of applicable elevator reference standards as it deals with elevator lobby design, use and construction.
- Review design and construction requirements for elevator lobbies, including but not limited to dimensions, location and separation.
- Review applicable code change history, technical studies and loss statistics as part of this review.

Based upon the extensive nature of this area of study**,** 5 Task Groups were formed during the process to provide in-depth review and to manage the number of issues. These task groups developed a number of proposals that were coordinated throughout the process.

More information on this CTC area of study can be found at the following link. http://www.iccsafe.org/cs/CTC/Pages/ElevatorLobbies.aspx

The focus is on necessary signage for entrance into elevator lobbies from interior exit stairway landings. This issue is more specific to Fire service access elevators and the potential for multiple required doors. The code currently requires direct access from the lobby to a stairway and additionally the same stairway must have a door that opens directly to the floor based upon standpipe access issues (i.e. limiting the number of doors that need to be open to lay hose during a fire). Fire fighters and occupants need to readily determine which door leads to the enclosed elevator lobby therefore signage is necessary to assist in wayfinding. The enclosed elevator lobby could be for fire service access elevators (FSAE) or occupant evacuation elevators. Since the signage need can apply to either type of enclosed elevator lobby and is related to interior exit stairways the requirements are proposed in Section 1022.

See discussion on CTC elevator lobby proposal coordination in code change FS##-12

Cost impact:

E144-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.10-E-BALDASSARRA-CTC.docx

E145 – 12
1022.10, 1022.10.1 (IFC [B] 1022.10, 1022.10.1)

Proponent: Homer Maiel, PE, CBO, Town of Atherton representing ICC Tri-Chapter (Peninsula, East Bay, and Monterey Bay)

Revise as follows:

1022.10 (IFC [B] 1022.10) Smokeproof enclosures ~~and pressurized stairways and ramps~~. Where required by Section 403.5.4 or 405.7.2, *interior exit stairways* and *ramps* shall be *smokeproof enclosure* ~~or pressurized~~ ~~*stairway* or *ramps*~~ in accordance with Section 909.20.

1022.10.1 (IFC [B] 1022.10.1) Termination and extension. A *smokeproof enclosure* ~~or pressurized~~ ~~*stairway*~~ shall terminate at an *exit discharge* or a *public way*. The *smokeproof enclosure* or ~~pressurized~~ ~~*stairway*~~ shall be permitted to be extended by an *exit passageway* in accordance with Section 1022.2. The *exit passageway* shall be without openings other than the *fire door assembly* required by Section 1022.2 and those necessary for egress from the *exit passageway*. The *exit passageway* shall be separated from the remainder of the building by 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.

Exceptions:

1. Openings in the *exit passageway* serving a *smokeproof enclosure* are permitted where the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*, and openings are protected as required for access from other floors.
~~2.~~ ~~Openings in the exit passageway serving a pressurized stairway are permitted where the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure or pressurized stairway.~~
2~~3~~. The *fire barrier* separating the *smokeproof enclosure* ~~or pressurized *stairway*~~ from the *exit passageway* is not required, provided the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure* ~~or pressurized *stairway*~~.
3~~4~~. A *smokeproof enclosure* ~~or pressurized *stairway*~~ shall be permitted to egress through areas on the level of discharge or vestibules as permitted by Section 1027.

Reason: The way that the current code language is, it gives the code users the impression that pressurized stairway is different from smokeproof enclosure. It is not. In fact pressurized stairway is a SPECIAL case of the smokeproof enclosure. In Chapter 9, smokeproof enclosure is covered under Section 909.20. In there, it specifies that in order to enter a smokeproof enclosure, one needs to first enter either an open exterior balcony or a ventilated vestibule. Then this section is followed by sub-Sections 909.20.1 through 909.20.4 on how to build this smokeproof enclosure. Then, comes Section 909.20.5 which is also a subsection to 909.20. In there, it gives the individual the option of eliminating vestibule if the enclosure is pressurized. All other subsections to 909.20 that deal with smoke proof enclosure still apply (ie, construction, door closure, etc.). By striking "pressurized stairway" this section becomes much simpler and cleaner. Also by doing so, Exception 2 becomes redundant

Cost Impact: This code change will not increase the cost of construction.

E145-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.19-E-Maiel.doc

E146–12
1022.10.1 (IFC [B] 1022.10.1)

Proponent: Ray Grill, P.E., Arup, representing self (Ray.Grill@arupgp.com)

Revise as follows:

1022.10.1 (IFC [B] 1022.10.1) Termination and extension. A *smokeproof enclosure* or pressurized *stairway* shall terminate at an *exit discharge* or a *public way*. The *smokeproof enclosure* or pressurized *stairway* shall be permitted to be extended by an *exit passageway* in accordance with Section 1022.3. The *exit passageway* shall be without openings other than ~~the *fire door* assembly required by Section 1022.3.1 and~~ those necessary for egress from the *exit passageway*. The *exit passageway* shall be separated from the remainder of the building by 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Exceptions:

1. Openings in the *exit passageway* serving a *smokeproof enclosure* are permitted where the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*, and openings are protected as required for access from other floors.
2. Openings in the *exit passageway* serving a pressurized *stairway* are permitted where the *exit passageway* is protected and pressurized in the same manner as the pressurized *stairway*.
3. ~~The *fire barrier* separating the smokeproof enclosure or pressurized *stairway* from the *exit passageway* is not required, provided the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure* or pressurized *stairway*.~~

~~4~~3. A *smokeproof enclosure* or pressurized *stairway* shall be permitted to egress through areas on the *level of exit discharge* or vestibules as permitted by Section 1027.

Reason: Exit passageways providing continuity of smokeproof enclosures or pressurized stairways are required to be protected in the same manner as the smokeproof enclosure or pressurized stairway. The current code language implies that it would **not** have to protected in the same manner and creates confusion for designers.

Cost Impact: None

E146-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.10.1-E-Grill.doc

E147 – 12
1023.3 (IFC [B] 1023.3)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1023.3 (IFC [B] 1023.3) Construction. *Exit passageway* enclosures shall have walls, floors and ceilings of not less than a 1-hour *fire-resistance rating*, and not less than that required for any ~~connecting~~ *interior exit stairway* or *ramp* <u>served</u>. *Exit passageways* shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Reason: There are situations where a one hour rated exit passageway connects to a two hour rated interior exit stairway but does not serve as an extension of the interior exit stairway. This occurs when the one hour exit passageway precedes the two hour interior exit stairway or ramp and is utilized on a particular floor of a multi-story one hour rated building to decrease exit access travel distance. The opening and fire barrier between the one hour exit passageway and two hour interior exit stairway is as required for continuity of the two hour interior exit stairway construction as found in 1022.2 and 716. Because of continuity requirements in chapter 7 for fire barriers and horizontal assemblies it is not feasible to construct a 2 hour rated exit passageway across the upper floors of a one hour rated building. As revised, whenever an exit passageway serves an interior exit stairway or ramp the passageway would still be rated as required for the interior exit stairway or ramp.

Cost Impact: This code change will not increase the cost of construction.

E147-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.3.1-E-Richardson.doc

E148 – 12
1023.7(New) [IFC [B] 1023.7(New)]

Proponent: Larry Lincoln, Salt Lake City Corporation representing Utah Chapter of International Code Council

Add new text as follows:

1023.7 (IFC [B] 1023.7) Ventilation. Equipment and ductwork for *exit passageway* ventilation as permitted by Section 1023.6 shall comply with one of the following:

1. The equipment and ductwork shall be located exterior to the building and shall be directly connected to the *exit passageway* by ductwork enclosed in construction as required for shafts.
2. Where the equipment and ductwork is located within the *exit passageway*, the intake air shall be taken directly from the outdoors and the exhaust air shall be discharged directly to the outdoors, or the air shall be conveyed through ducts enclosed in construction as required for shafts.
3. Where located within the building, the equipment and ductwork shall be separated from the remainder of the building, including other mechanical equipment, with construction as required for shafts.

In each case, openings into the fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by opening protectives in accordance with Section 716 for shaft enclosures.

Exit passageway ventilation systems shall be independent of other building ventilation systems.

Reason: Ventilation for exit passageways is currently not addressed in (2012) IBC section 1023. Since an exit passageway is essentially an extension/continuation of the interior exit stairway to the exit discharge or to a public way, the sterility of the environment of the exit passageway should reflect that of an interior exit stairway. Therefore, this new section reflects and is essentially the same ventilation requirements found in IBC section 1022.6 for interior enclosed exit stairways.

Cost Impact: None

E148-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1023.7-E-Lincoln.doc

E149 – 12
1024.5 (IFC [B] 1024.5)

Proponents: Jack Bailey, One Lux Studio, representing The International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

1024.5 (IFC [B] 1024.5) Illumination. Where *photoluminescent* exit path markings are installed, they shall be provided with ~~the minimum *means of egress* illumination required by Section 1006~~ <u>not less than 1 footcandle (11 lux) of illumination</u> for at least 60 minutes prior to periods when the building is occupied.

Reason: Stating the required illumination level here makes the code easier to use, and also makes it clear that illumination requirements for photoluminescent exit path markings are unrelated to illumination requirements for human vision. Furthermore, many people are confused by the two separate illumination requirements in Section 1006 (a **minimum** of 1 footcandle under normal power conditions, and an **average** of 1 footcandle under emergency power conditions), so a simple, clear statement in Section 1024.5 is better.

Cost Impact: The code change proposal will not increase the cost of construction.

E149-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1024.5-E-Bailey.doc

E150 – 12
202, 1025 (New) [IFC [B] 202, 1025 (New)]

Proponent: Jerry Anderson, LightSaver Technologies, Inc. representing LightSaver Technologies, Inc. (lightsavertech@gmail.com)

Add new definition as follows:

202
DEFINITIONS

EMERGENCY DOORWAY IDENTIFIER. A single station self-luminous audibly triggered supplemental visual notification alarm appurtenance.

Add new text as follows:

SECTION 1025 (IFC [B] 1025)
EMERGENCY DOOR IDENTIFIER; SUPPLEMENTAL ALARM APPURTENANCE

1025.1 (IFC [B] 1025.1) General. Where exit signs are required by Section 1011.1, an emergency doorway identifier device shall be installed .

1025.2 (IFC [B] 1025.2) Emergency doorway identifier. Emergency doorway identifiers shall be a linear light source that will illuminate, when activated, the entire periphery of an exit door assembly. The emergency doorway identifier shall illuminate when audible alarms are triggered or upon activation of the fire alarm or security system.

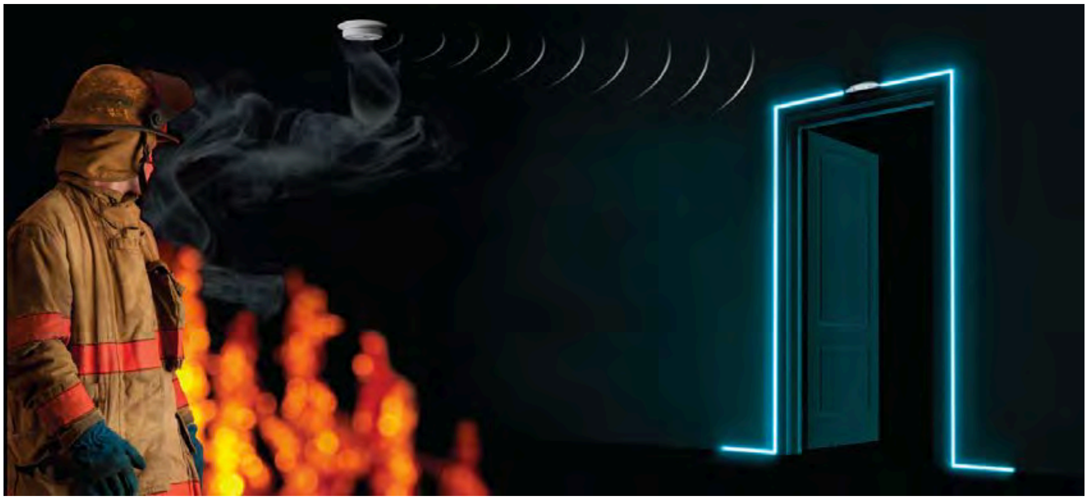
1025.3 (IFC [B] 1025.3) Adjacent area. Where lateral wall is available, emergency doorway identifiers shall be configured to light areas lateral to the door assembly along the top edge of baseboard for a minimum distance of not less than 6 inches (152 mm).

1025.4 (IFC [B] 1025.4) Testing. Where installed, emergency doorway identifiers shall be tested to verify their proper activation.

1025.5 (IFC [B] 1025.5) Installation. Emergency doorway identifiers shall be installed, inspected, tested, and maintained in accordance with the manufacturer's instructions.

1025.6 (IFC [B] 1025.6) Power Supply. Emergency Doorway Identifier shall provide illumination for a duration of not less than 90 minutes. In case of primary power loss, the emergency doorway identifier illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

Reason: The problem and the Emergency Doorway Identifier (EDI); a plausible part of the solution:



Quite simply; a smoke detector or fire alarm system will make a person aware of a fire; an Emergency Doorway Identifier will actually help a person locate a point of safe egress and resultingly; escape a fire. The emergency doorway identifier is the first innovation to clearly demark the exit in a fashion that even a young child can recognize and well below the line of smoke. EDI's are a tool that allow a person the maximum time possible to escape a smoke event (the ability to see the exit all the way down to the floor level) so that they might survive. This technology has not existed for long prior to the making of this proposal, therefore, there is no requirement for residential dwellings or other building or structures in existing code that require the use of EDI's. Although, the EDI's ability to dramatically increase the level of safety for occupants of any structure through its proven ability to clearly identify an exit in the form and fashion which EDI's are capable of will without doubt increase the chance of a persons survival in a smoke event. Unless made code, it will be up to the property owner to determine if EDI's provide tenants or the public the highest level of safety. By allowing local jurisdictions, to have the capability to adopt and require the use of EDI's to create safer environments for occupants within their jurisdictional geography will increase the likelihood of the appropriate use of this new technology as a best management practice.

Occupants deserve and should have the means to benefit from advancements in technology, especially inexpensive ones. Those who need and could utilize access to this technology most are "the most at risk from fire" (like children, elderly, visually impaired, hearing impaired and mentally disabled persons), but any occupant can benefit from its installation and use. There is a need to provide local jurisdictions with the ability to adopt and require the technology for the sake and safety of those whom are typically protected under any building or fire code; the governing jurisdiction's citizenry. Inclusion in the IBC and resulting adoption by local jurisdictions will create a safer building/structure environment for all and this can be accomplished generally through the requirement of developers, property operators and other property owners to insure this new safety measure in their properties as those buildings are developed, owned and/or operated. There is extremely insignificant cost associated with the adoption and use of EDI's relative to the typical properties' development or operating budgetary concerns and the payoff is priceless; i.e. the life of a human being and/or the avoidance of injury delivered through faster evacuation for others.

The modern fireground environment is riddled with materials that are more likely to feed fire to reach flashover in a shorter period of time. The increasing toxicity levels of the burning materials found in those firegrounds today regularly elevates occupant's and emergency responder personnel exposure to gasses and smokes that can kill or irreparably damage lungs in even small doses in very short periods of time. And, despite their incredible adeptness at doing more with less in every fire department in the land, fire departments across the nation are struggling with funding issues that directly hinder their ability to access the much needed funds to obtain and use the "absolute" highest standard of equipment and training. These phenomena can put everyone at a disadvantage. Some of this burden should be forced back upon the property operators and/or property owners to adopt the latest in fire-safety technological advancement; especially when they are as inexpensive as are EDI's.

EDI's offer a clear identification of the exit during the most life-and-injury critical time of a fire crisis; at the beginning and early stages of that fire. When a fire has just commenced happens to be when the person attempting to escape that fire has the greatest chance of survival; being within the first 2 minutes and PRIOR to the arrival of emergency personnel and usually at night (Karter 2008). When installed, EDI's allow every occupant, and especially "the most at risk from fire" (like children, elderly, visually impaired, hearing impaired and mentally disabled persons), the ability to quickly identify the exit by clearly demarking the outline the universally recognized shape of a door in an emergency pulse. And, EDI's are anything BUT inconspicuous when activated; especially in darkened or darkening settings like rooms filling with smoke in a fire.

Shorter periods of time to reach flashover due to modern materials
+ Financial and municipality budget pressures placed on firefighters that hinder their ability to perform and respond with to the absolute highest possible standard
+ <u>Higher toxicity levels of the smoke and gasses (carbon monoxide and cyanide) released in modern firegrounds</u>

= A growing compression of the time in the timeline for safe evacuation of occupants and the safety of the emergency personnel responding to these fires; which can, to a degree, be relieved with "On-Site" innovation and technology.

In America, there is a serious need to look to, and/or compel residents, developers, property operators, employers and others to adopt and utilize new technological advancements and embrace "on-site" means to raise the bar in the provision of safety in the structures that they or their tenants occupy. There is also a resounding need to decrease pressure on local firefighting responders to the degree plausible and to ultimately create safer environs for all through creating, adopting and enforcing visionary code. History has shown that, if left to their own profit-driven devices, new advancements are almost certain to be overlooked by property operators; especially in difficult economic times and local jurisdictions now need a means through which these safer environs can be achieved through the enforcement of a jurisdictionally elected codified requirement of EDI's in their local efforts to achieve higher safety standards for their citizenry.

As the fire response timelines are compressed across America due to budgetary constraints on equipment and personnel and traffic congestion induced by concomitantly growing urban sprawl, ALL innovative, different and better "on-site" ways of assisting occupants AND responding emergency personnel deserve consideration and contemplation; lives depend on it.

According to the NFPA, about 85% of all U.S. fire deaths in 2009 occurred in homes [residential settings] (Karter 2011) and smoke is the leading cause of fire related deaths. Most victims of fires die from smoke or toxic gases and not from burns (Hall 2001). When fire strikes, seconds count, and every innovation designed to provide for faster response for those in harm's way leads to greater chances for escape and this seriously merits the attention of those building, overseeing, operating and profiting from an evacuee's tenancy or habitation in any regulated building or structure.

A Plausible Part of the Solution:

Visual Emergency Information Exactly WHERE & WHEN Needed

Emergency Doorway Identifiers speed-up exit identification and enhance the location thereof by occupants in crisis incidents and similarly expedite the delivery of critical information exactly where needed and <u>always below the smoke layer</u> to assist evacuees during such an emergency crisis by brightly illuminating the whole exit in the critical moments before smoke becomes deadly and long before first responding emergency personnel can even hope to reach the scene (irrespective of response times). Emergency Doorway Identifiers provide an immediately and widely available **cost effective** solution for the identification of an exit during a fire or smoke event in a residence or any structure. The EDI provides its visual information from the top of an exit discharge all the way to the floor (and along the floors flanking the exit) which, by definition is ALWAYS WELL BELOW THE LINE OF SMOKE. By completely outlining and highlighting the exit's complete periphery, the EDI provides bright emergency light in the "exact" areas where needed as smoke fills a space (from the ceiling down) and at the "exact" times when needed. No other visual notification device can deliver this safety advantage to all occupants and to those entering the structure to save and or protect them.

Unique and Universally Recognized in an Emergency

Emergency Doorway Identifiers do not require the ability to read to detect the exit, thereby aiding the very young and people with visual disabilities, or other disabilities under the ADA, by providing a brightly illuminated outline of the universally recognized shape of a door quickly; thereby expediting a more prompt evacuation in a fire or smoke event. Emergency Doorway Identifiers remain functional at the commencement of the crisis and throughout the entire fire or smoke event. EDI's provide an unmatched ability for door/exit identification during the critical minutes of the crisis; long before first responders arrive. From a design standpoint, they are virtually inconspicuous until they are alarmed and do not detract from the planned aesthetics of the structure, building or space.

Assists First-Responders

Importantly, Emergency Doorway Identifiers also **aid emergency personnel** who enter a residence or any structure by enhancing the possibilities for that personnel's identification of a clear identified means of egress, regardless of the smoke layer elevation at the time they enter to perform their duties. By identifying the exits and discharges through the deployment of EDI's, rescue personnel's search, rescue, extraction and firefighting activities and operations are enhanced dramatically at all times while operating in, on and around the structure and fireground.

Part of a Well Thought Out Escape Plan

The installation of Emergency Doorway Identifiers can provide superior, yet inexpensively obtained, inconspicuous and easily installed life saving technology in existing most specifically to residential occupancy properties which contain three or more dwelling units, hotels, motels, lodging houses, bed and breakfast facilities, and congregate residences, i.e. the locations where they are needed the most. A well thought out escape plan would also dictate that, in addition to common points of egress in a structure which lead to a complete discharge from the structure; Emergency Doorway Identifiers should be located in all sleeping rooms above the interior doorway leading to the exit as well as exit discharges to a public space in an effort to reduce injuries and save lives through the provision of a unique form of visual means of egress information delivered in areas when need most and at the exact times when such information is needed by occupants attempting evacuation and escape.

Tremendous Support from the Firefighter Community

For the most at risk from fire, which are seniors and children, EDI technology should be considered "a must" for their residential and care centers and its formal recognition via inclusion in the International Building Code along with efforts on the National Fire Protection Association's #101 Life Safety Code® (underway as of the writing of this proposal) will allow local jurisdictions to adopt utilization of the innovation much like that of the smoke detector in the 1970's. Countless firefighters and building professionals across the land support this technology and recognize its potential to save lives. The technology was tested in a live burn-down exercise with the fire service in Santa Rosa, CA in 2010, and the response of the nearly 100 firefighters of all ranks that participated therein was overwhelmingly positive given their understanding of its potential to assist them in their regular fireground search, rescue, extraction and firefighting duties in unfamiliar surroundings. Without exception, responses from the firefighting community throughout the US has been resoundingly positive for the adoption of this technology due to its logical ability to solve an age old problem for anyone caught in a structure when on fire.

An innovative, useful and potentially life-saving innovation of this sort should not be overlooked; especially given the insignificant cost to the developer, property operator and/or homeowner who stands to benefit in the largest of ways from its capabilities. Giving local jurisdictions the capacity and ability to compel the adoption and use of the EDI through code is key to creating safer environments for all and ultimately; saving lives.

To learn more please visit: Wikipedia http://en.wikipedia.org/wiki/Emergency_Doorway_Identifiers_%28EDI%27s%29
To see an EDI actually working, please visit: YouTube http://www.youtube.com/watch?v=XJ-haxhq2y8
A Manufacturer of EDI's website with information can be reviewed here: http://www.thelightthatsaveslives.com/

Cost Impact: The code change proposal will insignificantly and virtually unnoticeably increase the cost of construction. The installation of the EDI does not require the oversight of a licensed electrician or any other specialist. EDI's are available through a variety of suppliers at prices ranging from $49.50 to $139.00 per device (per door) depending on the quantity being purchased and the channel through which it is obtained. This pricing does not include labor for the simple installation which is estimated to range from 5 to 15 minutes per door.

E150-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

10XX(New)-E-Anderson-Zozula.doc

E151 – 12
1025.1, 1025.4 (IFC [B] 1025.1, 1025.4)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1025.1 (IFC [B] 1025.1) Horizontal exits. *Horizontal exits* serving as an *exit* in a *means of egress* system shall comply with the requirements of this section. A *horizontal exit* shall not serve as the only *exit* from a portion of a building, and where two or more *exits* are required, not more than one-half of the total number of *exits* or total exit width shall be *horizontal exits*.

Exceptions:

1. *Horizontal exits* are permitted to comprise two-thirds of the required *exits* from any building or floor area for occupancies in Group I-2.
2. *Horizontal exits* are permitted to comprise 100 percent of the *exits* required for occupancies in Group I-3. At least 6 square feet (0.6 m^2) of accessible space per occupant shall be provided on each side of the *horizontal exit* for the total number of people in adjoining compartments. <u>Every compartment from which egress originates shall not be required to have a *stairway* or door leading directly outside, provided the adjoining compartment area into which a *horizontal exit* leads has *stairways* or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.</u>

1025.4 (IFC [B] 1025.4) Capacity of refuge area. The refuge area of a *horizontal exit* shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original *occupant load* of the refuge area plus the *occupant load* anticipated from the adjoining compartment. The anticipated *occupant load* from the adjoining compartment shall be based on the capacity of the *horizontal exit* doors entering the refuge area. The capacity of the refuge area shall be computed based on a *net floor area* allowance of 3 square feet (0.2787 m2) for each occupant to be accommodated therein.

Exception: The *net floor area* allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet (0.6 m^2) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m^2) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m^2) per occupant for nonambulatory occupancies in Group I-2.

The refuge area into which a *horizontal exit* leads shall be provided with *exits* adequate to meet the occupant requirements of this chapter, but not including the added *occupant load* imposed by persons entering it through *horizontal exits* from other areas. At least one refuge area exit shall lead directly to the exterior or to an *interior exit stairway* or *ramp*.

~~**Exception:** The adjoining compartment shall not be required to have a *stairway* or door leading directly outside, provided the refuge area into which a *horizontal exit* leads has *stairways* or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.~~

Reason: This Exception was created as part of E136-07/08. The report from that code cycle includes an analysis section that states: “An errata has been issued for section 1022.1, Exception 2. In the 2000 IBC this section had two paragraphs under the exception. The 2003 IBC and 2006 IBC show the second paragraph of Exception 2 moved out as a main section paragraph. There was no code change proposal to relocate this paragraph. Therefore, an errata has been issued for the 2003 and 2006 IBC to locate the paragraph starting “Every fire compartment….” As part of Exception 2.”

The original language that was subject to the errata prior to E136 read as follows: "Every fire compartment for which credit is allowed in connection with a horizontal exit shall not be required to have a stairway or door leading directly outside, provided the adjoining fire compartments have stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates."

The proponent stated in the reason associated with E136 with regard to the paragraph above: "Secondly, the second paragraph of section 1022.1 currently contains some confusing language referencing a fire compartment credit concept that is not recognized anywhere in Chapter 110. The paragraph has been rewritten in more contemporary language while maintaining the original technical intent. Additionally, based on IBC errata, the provision in question was originally intended to be an exception. Accordingly, it has been retained as an exception; however, it also been placed in context following the proposed second paragraph of section 1022.4. Approval of this proposal will clarify the intent of the code and assist users in the proper determination of horizontal exit technical requirements."

This code change merely deletes the revised E136 exception language (stated as an Exception to the second paragraph of Section 1025.4) and places it back as the second half of the exception 2 to Section 1025.1 (with minor changes to clarify the original intent of language prior to E136 and after the errata was applied). This location is consistent with the ICC errata and fits in from a context standpoint as the language refers to space on each side of the exit for adjoining compartments. In order to maintain this original intent the relocated exception language now starts off with "Every compartment from which egress originates…" in place of the pre E136 language "Every compartment for which credit is allowed in connection with a horizontal exit…" and the language follows by replacing "provided the adjoining compartments" from the pre E136 language with "provided the adjoining compartment area into which a *horizontal exit* leads…." This retains the original intent and clarifies the horizontal exits section which was also the intent of the E136-07/08 code change. The relocated and updated language (now in the second half of Section 1025.1, exception 2) as revised in this code change now properly describes the only situation where horizontal exits are permitted to comprise 100 percent of the exits in Group I-3.

Cost Impact: This code change does not increase the cost of construction.

E151-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1025.1-E-Richardson.doc

E152 – 12
1025.4 (IFC [B] 1025.4)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1025.4 (IFC [B] 1025.4) ~~Capacity of~~ Refuge area. The refuge area of a *horizontal exit* shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original *occupant load* of the refuge area plus the *occupant load* anticipated from the adjoining compartment. The anticipated *occupant load* from the adjoining compartment shall be based on the capacity of the *horizontal exit* doors entering the refuge area. The capacity shall be determined by dividing the horizontal exit door width by 0.20 inches (5.1 mm) per occupant.

> **Exception**: In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the anticipated occupant load from the adjoining compartment shall be determined based on the anticipated portion of the occupant load as normally distributed but not less the capacity determined in this section for the horizontal exit door.

1025.4.1 (IFC [B] 1025.4.1) Capacity. The capacity of the refuge area shall be computed based on a *net floor area* allowance of 3 square feet (0.2787 m^2) for each occupant to be accommodated therein.

> **Exception:** The *net floor area* allowable per occupant shall be as follows for the indicated occupancies:
>
> 1. Six square feet (0.6 m^2) per occupant for occupancies in Group I-3.
> 2. Fifteen square feet (1.4 m^2) per occupant for ambulatory occupancies in Group I-2.
> 3. Thirty square feet (2.8 m^2) per occupant for nonambulatory occupancies in Group I-2.

1025.4.2 (IFC 1025.4.2) Number of exits. The refuge area into which a *horizontal exit* leads shall be provided with *exits* adequate to meet the occupant requirements of this chapter, but not including the added *occupant load* imposed by persons entering it through *horizontal exits* from other areas. At least one refuge area exit shall lead directly to the exterior or to an *interior exit stairway* or *ramp*.

> **Exception:** The adjoining compartment shall not be required to have a *stairway* or door leading directly outside, provided the refuge area into which a *horizontal exit* leads has *stairways* or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

Reason: This Exception was created as part of E136-07/08. The report from that code cycle includes an analysis section that states: "An errata has been issued for section 1022.1, Exception 2. In the 2000 IBC this section had two paragraphs under the exception. The 2003 IBC and 2006 IBC show the second paragraph of Exception 2 moved out as a main section paragraph. There was no code change proposal to relocate this paragraph. Therefore, an errata has been issued for the 2003 and 2006 IBC to locate the paragraph starting "Every fire compartment…." As part of Exception 2."

The original language that was subject to the errata prior to E136 read as follows: "Every fire compartment for which credit is allowed in connection with a horizontal exit shall not be required to have a stairway or door leading directly outside, provided the adjoining fire compartments have stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates."

The proponent stated in the reason associated with E136 with regard to the paragraph above: "Secondly, the second paragraph of section 1022.1 currently contains some confusing language referencing a fire compartment credit concept that is not recognized anywhere in Chapter 110. The paragraph has been rewritten in more contemporary language while maintaining the original technical intent. Additionally, based on IBC errata, the provision in question was originally intended to be an exception. Accordingly, it has been retained as an exception; however, it also been placed in context following the proposed second paragraph of section 1022.4. Approval of this proposal will clarify the intent of the code and assist users in the proper determination of horizontal exit technical requirements."

This code change merely deletes the revised E136 exception language (stated as an Exception to the second paragraph of Section 1025.4) and places it back as the second half of the exception 2 to Section 1025.1 (with minor changes to clarify the original intent of language prior to E136 and after the errata was applied). This location is consistent with the ICC errata and fits in from a context standpoint as the language refers to space on each side of the exit for adjoining compartments. In order to maintain this original intent the relocated exception language now starts off with “Every compartment from which egress originates…” in place of the pre E136 language “Every compartment for which credit is allowed in connection with a horizontal exit…” and the language follows by replacing “provided the adjoining compartments” from the pre E136 language with “provided the adjoining compartment area into which a *horizontal exit* leads….” This retains the original intent and clarifies the horizontal exits section which was also the intent of the E136-07/08 code change. The relocated and updated language (now in the second half of Section 1025.1, exception 2) as revised in this code change now properly describes the only situation where horizontal exits are permitted to comprise 100 percent of the exits in Group I-3.

Splitting the section into parts is editorial. Where the exceptions are applicable will be clearer.

Cost Impact: This code change does not increase the cost of construction.

E152-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1025.4-E-Richardson.doc

E153 – 12
202, 1026.6 (IFC [B] 202, 1026.6)

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering representing Aon Fire Protection Engineering (al.godwin@aon.com)

Add new definition as follows:

SECTION 202
DEFINITIONS

OPEN-ENDED CORRIDOR. An interior corridor that is open on each end, and connects to an exterior *stairway* or *ramp* at each end with no intervening doors or separation from the corridor.

Revise as follows:

SECTION 1026 (IFC [B] 1026)
EXTERIOR EXIT STAIRWAYS AND RAMPS

1026.6 (IFC [B] 1026.6) Exterior stairway and ramp protection. *Exterior exit stairways* and *ramps* shall be separated from the interior of the building as required in Section 1022.2. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

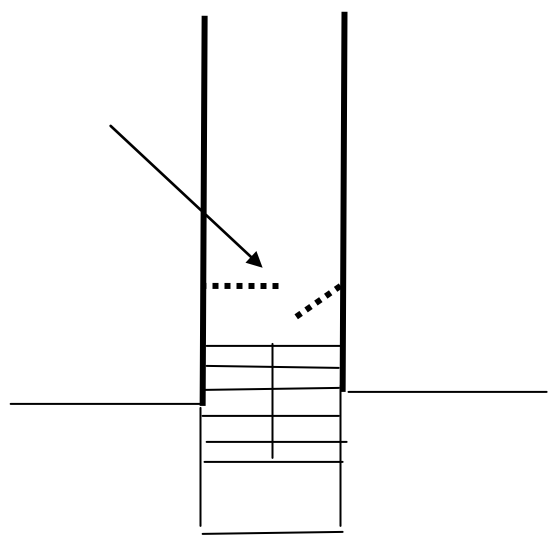
1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior stairway or ramp is served by an exterior ramp or balcony that connects two remote exterior stairways or other approved exits with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior stairway or ramp located in a building or structure that is permitted to have unenclosed exit access stairways in accordance with Section 1009.3.
4. Separation from the ~~interior~~ *open-ended corridor* of the building is not required for *exterior stairways* or *ramps* ~~connected to open-ended *corridors*~~, provided that Items 4.1 through 4.5 are met:
   - 4.1 The building, including *open-ended* *corridors*, and *stairways* and *ramps*, shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 4.2 The *open-ended corridors* comply with Section 1018.
   - 4.3 The *open-ended corridors* are connected on each end to an *exterior exit stairway* or *ramp* complying with Section 1026.
   - 4.4 The *exterior walls* and openings adjacent to the *exterior exit stairway* or *ramp* comply with Section1022.7.
   - 4.5 At any location in an *open-ended corridor* where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an *exterior stairway* or *ramp* shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

Reason: Breezeway stairs is what this section is talking about. Whether straight through the building with a stair on each side, or taking a turn somewhere during its path through the building with a stair on either end, it is still a breezeway with exterior stairs. This point is not clear in the current language.

There is this opinion that an open breezeway stairs are allowed by basic code. They are not. 2012 IBC Section 1026.6 states that exterior stairs must be separated from the interior of the building. The breezeway (interior “open ended” corridor) is part of the interior of the building. I have conferred with the original drafter of this code change many times and confirmed that the intent was to allow the removal of the wall and door that separates the stair from the corridor, creating a breezeway.

Many designers and jurisdictions assume that breezeway stairs are allowed by right. However, in order to not have to build the wall and fire door separating the exterior stair from the interior corridor, exception 4 must be complied with, which includes sprinklers in this breezeway.

The following is a representation of the intent of Exception 4, allowing the removal of the separation wall and door:



We are all familiar with the required protection on each side of the exterior stair as represented in the following clip from the 2000 International Building Code Commentary.

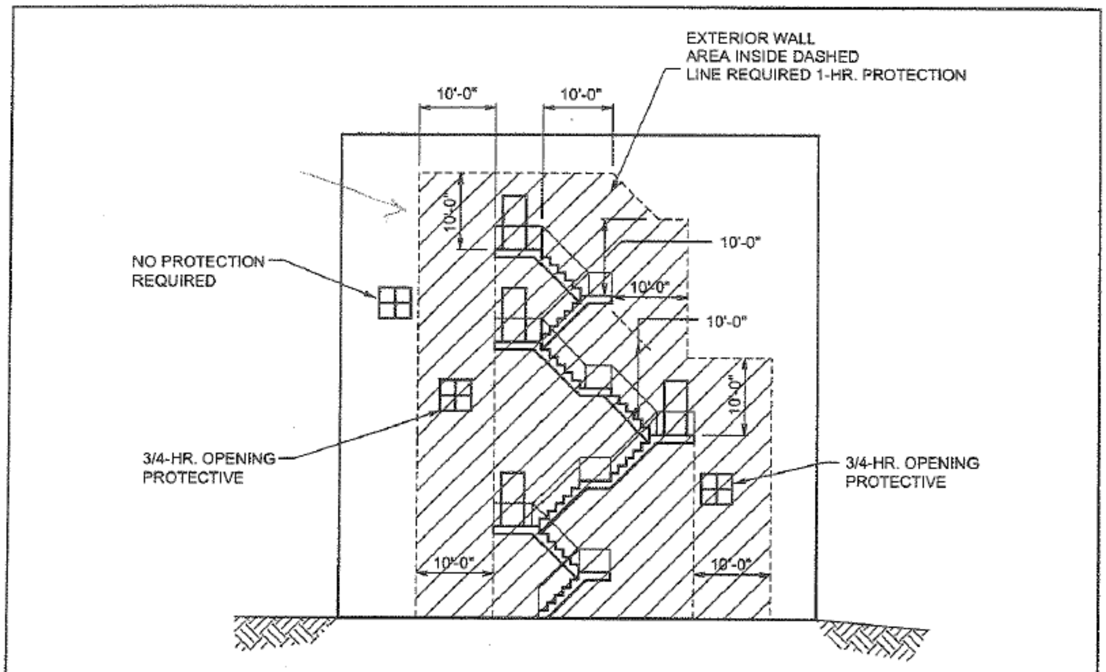
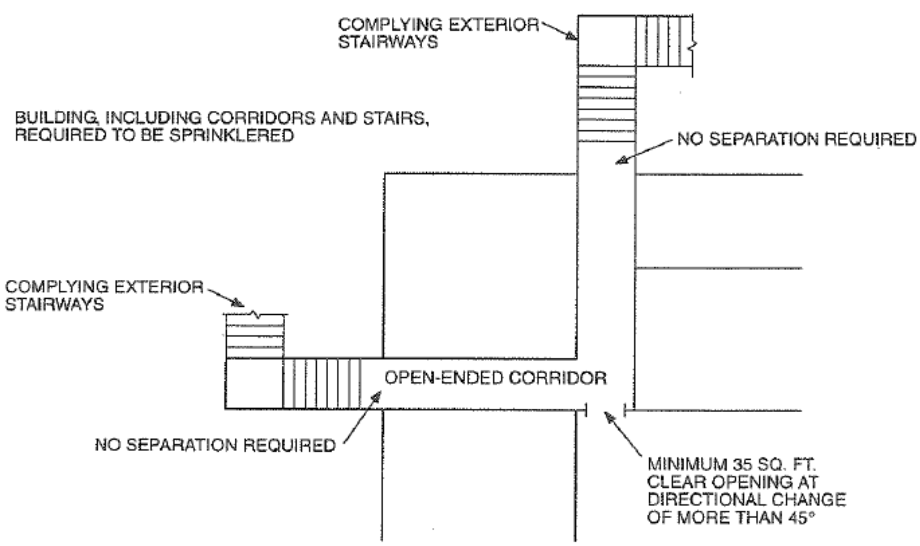


Figure 1005.3.6.5(1)
PROTECTION OF EXTERIOR STAIRWAYS

So, if the walls on each side of the stair have to be protected, how can a large opening where the door occurs be removed and have an unprotected connection to the interior corridor.

The 2000 IBC Handbook, provided the following accurate depiction of what this code change applied to as follows:



OPEN-ENDED CORRIDOR

FIGURE 1005-10

Here is the original code change that inserted the provision. Notice the statement "The purpose of this analysis was to determine if an equivalent level of life safety could be achieved by the design of an open breezeway in comparison to an enclosed corridor or balcony for these multifamily buildings." The code change was not to eliminate the protection between the unit and the stair, but to remove the protection (wall and fire rated door) between the stair and what would have been an interior corridor.

technical change.

Public Hearing: Committee: AS AM D
Assembly: ASF DF

1008.7-2

Proponent: Ron Nickson, National Multi Housing Council/National Apartment Association

1. Revise as follows:

1008.7 Exterior exit stairways. Exterior exit stairways that conform to the requirements for interior exit stairways except for the enclosure requirements, are permitted as an element of a required means of egress for buildings not exceeding six stories or 75 feet (22.9 m) in height for occupancies other than Group I-2.

An exterior exit stairway that serves as an exit component shall be open to the outside on at least one side except for required structural columns beams, ~~and open-type~~ handrails and guards. A minimum of 35 square feet (3.22 m^2) of aggregate open area shall be provided within the horizontal projection of each floor to ceiling level at each exterior stair or within the horizontal projection of the floor to ceiling level of the stairway landing that is located no more than 1/2 level above the corridor floor.

The adjoining open areas shall be either yards, courts or public ways; the remaining sides are permitted to be enclosed by the exterior walls of the building. Any stairway not meeting the definition of an exterior stairway shall comply with the requirements for interior stairways.

Exterior stairways shall be located in accordance with Section 1009.1.

2. Revise the definition of Stairway, Exterior as follows:

SECTION 1002
DEFINITIONS

STAIRWAY, EXTERIOR A stairway that is open on at least one side, except for required structural columns, beams, ~~and open-type~~ handrails, and guards. The adjoining open areas shall be either yards, courts or public ways; the other sides of the exterior stairway need not be open.

Reason: To establish minimum requirements for open area on exterior exit stairways and permit the use of enclosed guards and handrail systems.

The 35 sq. ft. of open area is based on computer fire studies of six multifamily projects in Virginia containing more than 2000 individual dwelling units. The analysis was completed by the Sullivan Code Group using HAZARD I, a fire hazard assessment method developed by the United States National Institute of Standards and Technology. The procedures used by the Sullivan Code Group were reviewed by Professor Jonathan Barnett, Ph.D., Associate Professor, Center for Firesafety Studies, Worcester Polytechnic Institute who checked for conformity with the fire modeling expectations and limitations.

The findings, which are based on the provisions in the 1996 BOCA National Building Code, apply equally to the provisions in the IBC. The results, summarized by the Sullivan Code Group in the following Executive Summary, for the six buildings included in the studies were very similar. The buildings studied were multifamily apartments with various configurations of corridors connected to exterior open stairs.

EXECUTIVE SUMMARY

The purpose of this analysis was to determine if an equivalent level of life safety could be achieved by the design of an open breezeway in comparison to an enclosed corridor or a balcony for these multifamily buildings.

The multifamily buildings were analyzed using engineering judgement, referenced literature, the suite of computer programs called FASTlite, and CFAST and, computer-based fire models developed by the United States National Institute of Standards and Technology, Building and Fire Research Laboratory.

The reasonable worst case fire scenario modeled was an arson fire on the breezeway. By assuming that the design fire is a fast growing arson fire, this analysis goes beyond the requirements of the Building Code which does not consider arson fire situations in determining building fire safety regulations. Therefore, this analysis is evaluating the building under more adverse conditions than are addressed in the Building Code. The results of the analysis are:

1. For the life safety of the building occupants on the floor of fire origin, the open breezeway configuration is superior to the enclosed corridor configuration.
2. For the life safety of the building occupants on floors other than the floor of fire origin, the open breezeway configuration meets the intent of the egress provisions in the BOCA Code. With the open breezeway configuration, at least one stairwell should maintain tenable egress conditions depending on the wind direction. In all cases analyzed, one stairwell was capable of handling the occupant load. Therefore, the intent of the code is met.
3. Smoke conditions on floors other than the floor of fire origin will remain safe for a suitable period of time to allow occupant egress with the open breezeway configuration, even without sprinklers. If there is a wind, the tenability in the open breezeways is improved.
4. With the enclosed corridor configuration, sprinkler activation is predicted to occur after the time at which the upper smoke layer reaches a level that could impede egress. With the open breezeway configuration, sprinkler activation is predicted to occur prior to the time at which the upper smoke layer reaches a level that could impede egress.
5. The results of this analysis have demonstrated that an open breezeway protected by quick response automatic sprinklers provides occupant egress conditions which are better than code-complying balcony designs. Therefore an open breezeway protected by quick response sprinklers, as designed for this project, should be regulated by the same requirements as the open balcony which does not require a fire resistance rated floor when standard response automatic sprinklers are present. The design of the open breezeway provides a level of life safety equivalent or superior to that required by the BOCA Code Sections 106.2 and 106.4.

Copies of the Fire Studies are submitted for reference (see NMHC/NAA proposal for Section 1004.7). Additional copies are available from the proponent.

Public Hearing: Committee: AS AM D
Assembly: ASF DF

Last cycle, code change E134-09/10 made it clear that this exception only applied to the wall and door that would normally separate an exterior stair from the interior corridor. This exception does not apply to other separation requirements on the sides of the stairs.

The specific section reasoning for this code change is as follows:

Section 202, provide a definition of an open-corridor. The term open-ended *corridor* is already used in the provision. Hopefully this will expand on code change E134-09/10 to clarify that this provision is only to eliminate the separation required between the stair and the interior corridor. Not the units on either side.

Section 1026.6, expanding the same concept, adding clarity.

In the Group B cycle, the following code change is to be submitted:

Part III

IBC/IFC, Add new Section 903.3.1.2.2 to read as follows:

903.3.1.2.2 Open-ended Corridors. Sprinkler protection shall be provided in *open-ended corridors* serving *exterior stairways* and *ramps* as specified in Section 1026.6, exception 4.

Section 903.3.1.2.2 will now clarify that when a 13R system is used, extra heads must be installed in the open ended corridor in order to claim a breezeway stair. As with Section 903.3.1.2.1, this protection is above the requirements of a standard 13R system. If not checked in the design, these heads will not be installed. As such, the open-ended corridor will not be in compliance with code.

Also for discussion in the Group B cycle is the following possible change:

Part IV

IFC Section 1104.21, change to read as follows:

1104.21 Exterior stairway protection. Exterior *exit stairs* shall be separated from the interior of the building as required in Section 1026.6 . Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. (unchanged)
2. (unchanged)
3. (unchanged)

4. Separation from the ~~interior~~ *open-ended corridor* of the building is not required for *exterior stairways* ~~connected to open-ended *corridors*~~, provided that:

~~4.1 The building, including *corridors*, and stairs, is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.~~

4.~~2~~ 1 The *open-ended corridors* comply with Section 1018.

4.~~3~~ 2 The *open-ended corridors* are connected on each end to an *exterior exit stairway* complying with Section 1026.

4.4 3 At any location in an *open-ended corridor* where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an *exterior stairway* or *ramp* shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

In Texas, there a thousands of existing breezeway stair apartments. Although not addressed by the UBC it was felt that breezeway stairs were allowed by right. Many of these apartments are either:

1. not sprinklered; or
2. sprinklered with a 13R system and do not have extra heads in the breezeway.

As such, item 4.1 would retroactively require sprinklers in non-sprinklered apartments on office buildings with breezeways, or the installation of extra heads in 13R apartments. This constitutes a retroactive Group R and B sprinkler provision.

Cost Impact: This code proposal will not increase the cost of construction since no extra construction costs are involved.

E153-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1026.6-E-Godwin.doc

E154 – 12
1026.6 (IFC [B] 1026.6)

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing Tri-Chapter (Peninsula, East Bay and Monterey Bay Chapters of ICC) (dennisrichardsonpe@yahoo.com)

Revise as follows:

1026.6 (IFC [B] 1026.6) Exterior stairway and ramp protection. *Exterior exit stairways* and *ramps* shall be separated from the interior of the building as required in Section 1022.2. Openings shall be limited to those necessary for egress from normally occupied spaces. <u>Where a vertical projection of the planes of the guard of an exterior stairway or ramp including landings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the exterior wall shall be rated in accordance with Section 1022.7.</u>

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior stairway or ramp is served by an exterior ramp or balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior stairway or ramp located in a building or structure that is permitted to have unenclosed exit access stairways in accordance with Section 1009.3.
4. Separation from the interior of the building is not required for exterior stairways or ramps connected to open-ended corridors, provided that Items 4.1 through 4.5 are met:
   - 4.1 The building, including corridors, stairways or ramps, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 4.2 The open-ended corridors comply with Section 1018.
   - 4.3 The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1026.
   - 4.4 The exterior walls and openings adjacent to the exterior exit stairway or ramp comply with Section 1022.7.
   - 4.5 At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an exterior stairway or ramps shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

Reason: Current practice as explained in the past two IBC Code and Commentary editions is to require this protection consistent with the requirement in Section 1022.7 for protection of interior stairways and ramp exterior walls. Section 1022.7 is not referenced in 1026.6 or in 1022.2. The proposed language is similar to 1022.7 except that instead of measuring the angle between the building exterior walls and the unprotected walls at the exterior of the stairway or ramp, the proposed language measures between the building exterior walls and a vertical projection for the planes of the guard of the exterior stairway and ramp including landings. If the current practice as outlined in the IBC Code and Commentary is not correct then this code change should be disapproved and the Code and Commentary should be updated.

Cost Impact: This code change will not increase the cost of construction from current practice.

E154-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1026.6-E-Richardson.doc

E155 – 12
1027.1 (IFC [B] 1027.1)

Proponent: Robert J Davidson, Davidson Code Concepts LLC, representing SaftiFirst a Division of O'Keeffes, Inc. (rjd@davidsoncodeconcepts.com)

Revise as follows:

1027.1 (IFC [B] 1027.1) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and capacity of the required exits.

1. A maximum of 50 percent of the number and capacity of interior exit stairways and ramps is permitted to egress through areas on the level of exit discharge provided all of the following are met:
    1.1. Such enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.
    1.2. The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.
    1.3. The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.
2. A maximum of 50 percent of the number and capacity of the interior exit stairways and ramps is permitted to egress through a vestibule provided all of the following are met:
    2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.
    2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
    2.3. The area is separated from the remainder of the level of exit discharge by construction providing <u>45 minutes of fire-resistance rated</u> protection ~~at least~~ ~~the equivalent of approved wired glass in steel frames~~.
    2.4. The area is used only for means of egress and exits directly to the outside.
3. *Horizontal exits* complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

Reason: The purpose of this proposal is to eliminate a left over reference to "wired glass" for purposes of fire protection. The last few cycles references to wired glass have been replaced with references to fire-rated glazing or other generic terms to eliminate a reference to a specific product.

The reference here is replaced with a requirement of 45 minutes of fire resistance because that is the level of fire-resistance rating historically associated with wired glass in steel frames and the code section is looking for that equivalent.

From NFPA 257-2007, "Standard on Fire Test for Window and Glass Block Assemblies":

> ***B.2.3*** *The current requirements for fire test duration are open, whereas previous editions limited the duration to 45 minutes. With the advent of new glazing materials that provide various levels of fire protection, the current requirements have responded to the needs of the industry and the fire protection community by establishing various fire protection ratings that are both longer and shorter than the previous 45-minute specification.* <u>*The 45-minute limit was based on the ability of standard wired glass to perform satisfactorily in accordance with earlier editions of NFPA 257.*</u>

Cost Impact: This code change will not increase construction costs.

E155-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1027.1-E-Davidson.doc

E156– 12
1027.6 (New) [IFC [B] 1027.6 (New)]

Proponent: Dennis Richardson, PE; Building Official, City of Salinas, representing self (dennisrichardsonpe@yahoo.com)

Add new text as follows:

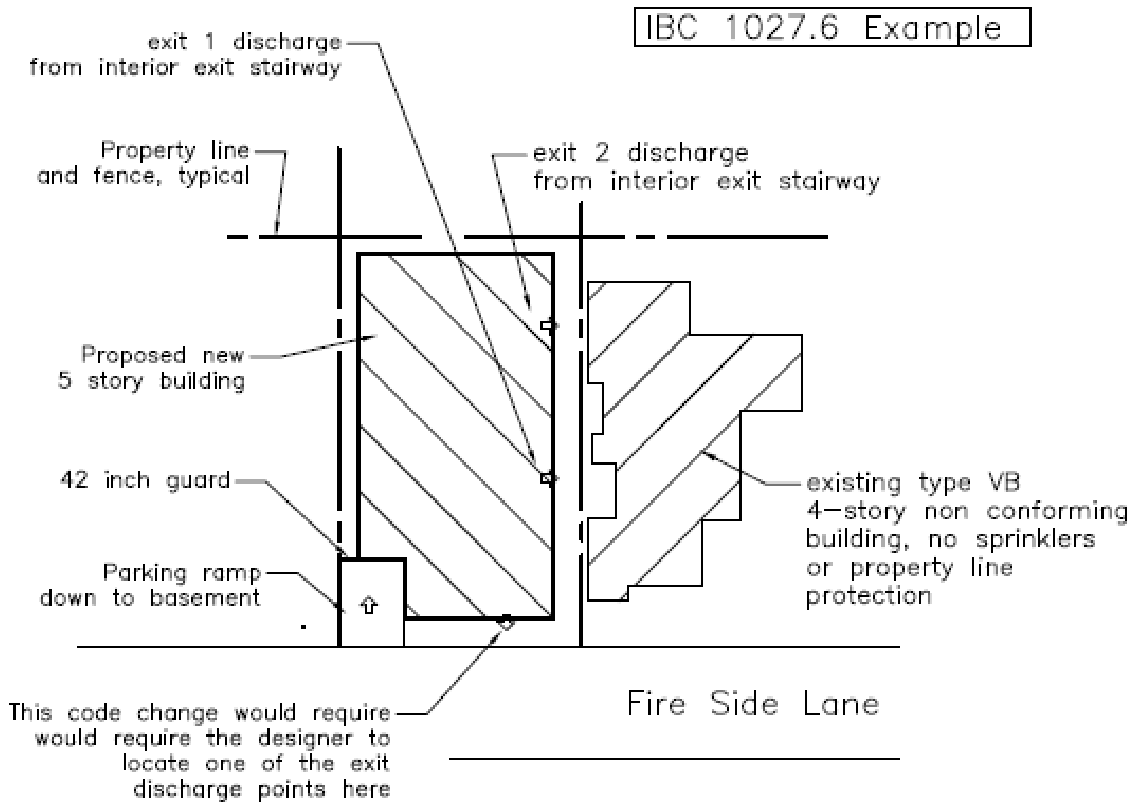
1027.6 (IFC [B] 1027.6) Location of exit discharge. When a new building requires more than one exit, at least one of the required exits available to all occupants shall discharge into the public way or an egress court that is remotely located and not subject to exposure from a single fire in any building located on the adjacent lot.

Exceptions:

1. The existing building on the adjacent lot is sprinklered throughout with an automatic sprinkler system in accordance with Section 903.1.1.1 or 903.1.1.2.
2. The existing building on the adjacent lot has exterior walls constructed in accordance with Section 705.
3. The new building as proposed and the existing building on the adjacent lot conform with Section 705.3 if both buildings are assumed to be constructed on the same lot with an assumed imaginary line.

Reason: Current code would allow the construction of a new building having all of the required egress discharge exclusively into a single egress court that can be rendered useless and dangerous with a single fire in an unprotected building on an adjacent lot. When a new building is constructed there is a sufficient opportunity to plan for an egress system that will provide basic performance and life safety in this event. See example 1027.6. This proposal also provides exceptions to the proposed requirement if the existing building on the adjacent lot is sprinklered throughout , if the existing building on the adjacent lot has properly constructued exterior walls, or if the new building and the existing building would conform with 705.3 if they were assumed to be on the same lot and they are sufficiently separated so that they would conform with 705.3 with an imaginary line between them.

In summary: this code change proposes to make the protection relied on for egress courts between a new building and an existing nonconforming buildings on and adjacent lot comparable to the condition if they were both located on the same lot or the designer must locate one of the required exits so it is not affected by a single fire in a nonconforming building on an adjacent lot.



Cost Impact: This code change will not increase the cost of construction.

E156-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1027.6(New)-E-Richardson.doc

E157 – 12
1028.6.1, 1028.6.2 (IFC [B] 1028.6.1, 1028.6.2)

Proponent: Gene Boecker, AIA, Code Consultants, Inc, representing self

Revise as follows:

1028.6 (IFC [B] 1028.6) Width of means of egress for assembly. The clear width of aisles and other means of egress shall comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

1028.6.1 (IFC [B] 1028.6.1) Without smoke protection. The clear width of the means of egress shall provide sufficient capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of width for each occupant served shall be provided on stairs having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional stair width for each occupant shall be provided for each 0.10 inch (2.5 mm) of riser height above 7 inches (178 mm).
3. Where egress requires stair descent, at least 0.075 inch (1.9 mm) of additional width for each occupant shall be provided on those portions of stair width having no handrail within a horizontal distance of 30 inches (762 mm).
4. Ramped means of egress, where slopes are steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.22 inch (5.6 mm) of clear width for each occupant served. Level or ramped means of egress, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of clear width for each occupant served.
5. Means of egress outside the seating area shall provide capacity in accordance with Section 1005.

1028.6.2 (IFC [B] 1028.6.2) Smoke-protected seating. The clear width of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for smoke-protected assembly seating. The clear width required for capacity shall be permitted to determine the required clear width for means of egress outside the seating area where smoke protection is maintained along the means of egress route. Where the exits serve occupants egressing from both smoke protected and non-smoke protected areas, the inches of clear width for each occupant in accordance with Table 1028.6.2 and Section 1005 shall be permitted to be calculated proportionally to the occupant loads served.

> **Exception:** For an outdoor *smoke-protected assembly seating* with an *occupant load* not greater than 18,000, the clear width shall be determined using the factors in Section 1028.6.3.

Reason: The provisions in the code as written are confusing. It is not clear how egress for smoke protected assembly seating is supposed to be addressed once the egress is outside the seating area. This proposal is consistent with the methodology used for the design of smoke protected assembly seating venues since prior to the ICC. The text in the legacy codes had separate provisions for means of egress within and outside of the seating areas that clearly allowed them to be treated in this manner. When the code texts were combined into the IBC, this aspect was lost due to the way the code language was worded.

This issue has been interpreted in the manner noted above to suggest that once outside the seating area, the factors should revert to those noted in Section 1005. For large venues like arenas, an alternative interpretation could effectively create a ring of exits from the areas outside the seating area. This is not how these facilities have been constructed over the years. IN addition, this proposal addresses the method of calculation for the capacity of exits that serve both smoke protected assembly seating and non-smoke protected areas. Approval of this code change will not alter the way in which the code has been applied but simply clarify the way it has been done.

Cost Impact: The code change proposal will not increase the cost of construction although the improper interpretation of these provisions certainly would.

E157-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.6.1-E-Boecker.doc

E158 – 12
1028.6.2 (IFC [B] 1028.6.2)

Proponent: Daniel E. Nichols, P.E., New York State Division of Code Enforcement and Administration, Albany, NY (dan.nichols@dos.state.ny.us)

Revise as follows:

1028.6.2 (IFC [B] 1028.6.2) Smoke-protected seating. The clear width of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. ~~A life safety evaluation, complying with NFPA 101, shall be done~~ Facilities utilizing the reduced width requirements of Table 1028.6.2 for smoke protected assembly seating shall also comply with the requirements of Sections 404.2 and 408.2 of the *International Fire Code*.

> **Exception:** For an outdoor *smoke-protected assembly seating* with an *occupant load* not greater than 18,000, the clear width shall be determined using the factors in Section 1028.6.3.

Reason: The purpose of this code change proposal is to remove the requirements of the 'life safety evaluation' in favor of the fire and life safety preparedness requirements found in the International Fire Code.

The life safety evaluation is utilized only when smoke-protected seating is desired to be used by the regulated party; mainly to utilize the occupant calculations published in Section 1028 regarding aisle and stair widths rather than the prescriptive aisle and stair width requirements. Upon review of the life safety evaluation, the contents within NFPA 101 Section 12.4.1, the requirements call for an assessment of the assembly space regarding different types of emergencies, but do not provide any direction on what the minimum requirements are nor does it make any reference to other Sections of NFPA 101 to provide guidance to the code user. It should be noted that the requirements of the life safety evaluation also require the document to be updated annually (12.4.1.1 (3)), which is outside the scope of the IBC.

This proposal replaces the life safety evaluation with documentation that is already required by the International Fire Code; specifically the fire safety and evacuation plan and the specific assembly occupancy provisions. This provides the following benefits:

1. Many of the items that are required in the life safety evaluation are covered in the fire safety and evacuation plan required by 404 of the IFC.
2. IFC Sections 401.2 and 401.4 give authority for the fire code official to enforce compliance with and approve the fire safety and evacuation plan; whereas ongoing compliance and enforcement of the required update of the life safety evaluation is not required by the IFC.
3. IFC Section 404 gives the code user specific details on what should be considered in an evacuation plan which, in turn, gives the code user guidance on what the output of such plan should be.
4. IFC Section 408.2 sets specific criteria on the limitations of a seating plan and occupancy limits; and is directly enforceable by IFC Section 401.2 and 401.4.

Cost Impact: By not requiring redundant documentation, this code change will lessen the operational and maintenance costs of certain assembly occupancies.

E158-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.6.2-E-Nichols.doc

E159 – 12

1028.9.5, 1028.9.7(New), 1028.9.8(New), 1028.10-1028.10.3(New); [IFC [B] 1028.9.5, 1028.9.7(New), 1028.9.8(New), 1028.10-1028.10.3(New)]

Proponent: Ed Roether, Ed Roether Consulting, representing self (ed@edroetherconsulting.com)

Revise as follows:

1028.9.5 (IFC [B] 1028.9.5) Assembly aisle termination. Each end of an *aisle* shall terminate at cross *aisle*, foyer, doorway, vomitory, ~~or~~ concourse or stairway in accordance with Section 1029.9.7 having access to an *exit*.

Exceptions:

1. Dead-end *aisles* shall not be greater than 20 feet (6096 mm) in length.
2. Dead-end *aisles* longer than 20 feet (6096 mm) are permitted where seats beyond the 20-foot (6096 mm) dead-end *aisle* are no more than 24 seats from another *aisle*, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row.
3. For *smoke-protected assembly seating*, the dead-end *aisle* length of vertical *aisles* shall not exceed a distance of 21 rows.
4. For *smoke-protected assembly seating*, a longer dead-end *aisle* is permitted where seats beyond the 21-row dead-end *aisle* are not more than 40 seats from another *aisle*, measured along a row of seats having an *aisle* accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row.

1028.9.6 (IFC [B] 1028.9.6) Assembly aisle obstructions. There shall be no obstructions in the required width of aisles except for handrails as provided in Section 1028.13.

1028.9.7 (IFC [B] 1028.9.7) Stairways connecting to aisle stairs. A stairway that connects an aisle stair to a cross aisle or concourse shall be permitted to comply with the assembly aisle walking surface requirements of Section 1028.11. Transitions between stairways and aisle stairs shall comply with Section 1028.10.

1028.9.8 (IFC [B] 1028.9.8) Stairways connecting to vomitories. A stairway that connects a vomitory to a cross aisle or concourse shall be permitted to comply with the assembly aisle walking surface requirements of Section 1028.11. Transitions between stairways and aisle stairs shall comply with Section 1028.10.

1028.10 (IFC [B] 1028.10) Transitions. Transitions between stairways and aisle stairs shall comply with either Section 1028.10.1 or 1028.2.

1028.10.1 (IFC [B] 1028.10.1) Transitions and stairways that maintain aisle stair riser and tread dimensions. Aisle stairs, transitions and stairways that maintain riser and tread dimensions shall comply with Section 1028.11 as one exit access component.

1028.10.2 (IFC [B] 1028.10.2) Transitions to stairways that do not maintain aisle stair riser and tread dimensions. Transitions between aisle stairs with riser and tread dimensions that differ from the stairways shall comply with this section

1028.10.2.1 (IFC [B] 1028.10.2.1) Stairways and aisle stairs in a straight run. Transitions where the stairway is a straight run from the aisle stair shall have a minimum depth of 22 inches (559 mm) where the treads on the descending side of the transition have greater depth and 30 inches (762 mm) where the treads on the descending side of the transition have lesser depth.

1028.10.2 (IFC [B] 1028.10.2) Stairways and aisle stairs that change direction. Transitions where the stairway changes direction from the aisle stair shall have a minimum depth of 11 inches (280 mm) or the aisle stair tread depth, whichever is greater, between the aisle stair and stairway.

1028.10.3 (IFC [B] 1028.10.3) Transition marking. A distinctive marking stripe shall be provided at each nosing or leading edge adjacent to the transition. Such stripe shall be a minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide. The edge marking stripe shall be distinctively different from the aisle stair contrasting marking stripe.

(Renumber remaining sections)

Reason: Stepped elements that connect aisles having direct connection to aisle accessways and other exit access components is dictated by lines of sight requirements similar to the aisles. These stepped elements are commonly considered aisles rather than stairways given the current definition of an aisle. However, there is confusion regarding these stepped elements and there are many types of conditions that are found for these elements within assembly seating. This proposal is intended to address these stepped elements and provide criteria specifically for them and eliminate the confusion related to them. Line of sight requirements prevent these stairways from complying with the stairway criteria including landing provisions. Traversing an aisle requires more attention than traversing an exit stairway and the minimum depths for the transitions of this proposal coordinate with the line of sight limitations and cadence of traversing an aisle. It also draws attention to the transition similar to aisle locations where a change in riser height occurs.

Cost Impact: Minimal

E159-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.9.5-E-Roether.doc

E160-12

1028.9.5, 1028.10.2.1, Table 1028.10.2.1, 1028.10.2.2; (IFC [B] 1028.9.5, 1028.10.2.1, Table 1028.10.2.1, 1028.10.2.2)

Proponent: Dan Casella, Chair, ICC 300 Development Committee, Standard for Bleachers, Folding and Telescopic Seating and Grandstands

Revise as follows:

1028.9.5 (IFC [B] 1028.9.5) Assembly aisle termination. Each end of an *aisle* shall terminate at cross *aisle*, foyer, doorway, vomitory or concourse having access to an *exit*.

Exceptions:

1. Dead-end *aisles* shall not be greater than 20 feet (6096 mm) in length.
2. Dead-end *aisles* longer than <u>16 rows</u> ~~20 feet (6096 mm)~~ are permitted where seats beyond the <u>16th row</u> ~~20-foot (6096 mm)~~ dead-end *aisle* are no more than 24 seats from another *aisle*, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row <u>where seats have backrests or beyond ten where seats are without backrests in the row</u>.
3. For *smoke-protected assembly seating*, the dead end *aisle* length of vertical *aisles* shall not exceed a distance of 21 rows.
4. For *smoke-protected assembly seating*, a longer dead-end *aisle* is permitted where seats beyond the 21-row dead-end *aisle* are not more than 40 seats from another *aisle*, measured along a row of seats having an *aisle* accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row <u>where seats have backrests or beyond ten where seats are without backrests in the row</u>.

1028.10.2.1 (IFC [B] 1028.10.2.1) Dual access. For rows of seating served by *aisles* or doorways at both ends, there shall not be more than 100 seats per row. The minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.3 inch (7.6 mm) for every additional seat beyond 14 seats <u>where seats have backrests or beyond 21 where seats are without backrests</u>. ~~, but~~ The minimum clear width is not required to exceed 22 inches (559 mm).

Exception: For s*moke-protected assembly seating*, the row length limits for a 12-inch-wide (305 mm) *aisle accesswa*y, beyond which the *aisle accessway* minimum clear width shall be increased, are in Table 1028.10.2.1.

TABLE 1028.10.2.1 (IFC [B] TABLE 1028.10.2.1)
SMOKE-PROTECTED ASSEMBLY AISLE ACCESSWAYS

TOTAL NUMBER OF SEATS IN THE SMOKE PROTECTED ASSEMBLY OCCUPANCY	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY			
	Aisle or doorway at both ends of row		Aisle or doorway at one end of row only	
	<u>Seats with backrests</u>	<u>Seats without backrests</u>	<u>Seats with backrests</u>	<u>Seats without backrests</u>
Less than 4,000	14	<u>21</u>	7	<u>10</u>
4,000	15	<u>22</u>	7	<u>10</u>
7,000	16	<u>23</u>	8	<u>11</u>
10,000	17	<u>24</u>	8	<u>11</u>
13,000	18	<u>25</u>	9	<u>12</u>
16,000	19	<u>26</u>	9	<u>12</u>

TOTAL NUMBER OF SEATS IN THE SMOKE PROTECTED ASSEMBLY OCCUPANCY	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY			
	Aisle or doorway at both ends of row		Aisle or doorway at one end of row only	
	Seats with backrests	Seats without backrests	Seats with backrests	Seats without backrests
19,000	20	27	10	13
22,000 and greater	21	28	11	14

For SI: 1 inch = 25.4 mm.

1028.10.2.2 (IFC [B] 1028.10.2.2) Single access. For rows of seating served by an *aisle* or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch (15.2 mm) for every additional seat beyond seven seats where seats have backrests or beyond ten where seats are without backrests. ~~,but~~ the minimum clear width is not required to exceed 22 inches (559 mm).

> **Exception:** For *smoke-protected assembly seating*, the row length limits for a 12-inch-wide (305 mm) *aisle accessway*, beyond which the *aisle accessway* minimum clear width shall be increased, are in Table 1028.10.2.1.

Reason: The intent of this proposal is for coordination with ICC 300 Section 407.3, 407.4 and 407.5.

This proposal is an extension of the recognition of the fact that bench seating without backrests allows easier and quicker lateral movement along a bleacher type row as compared with rows of seating which are provided with backrests. In seating with backrests, occupants typically must remain facing forward or approximately perpendicular to the aisle access and side step toward the aisle. The wider the aisle access, the more the occupants are allowed to turn and walk toward the aisle. When backrests are not present it is possible to turn and face parallel to the aisle access regardless of aisle access width. This in turn allows a walking style motion instead of side stepping.

Seating without backrests also allows easier vertical movements between rows without climbing over seatbacks or using aisles. Although this is not a consideration during normal egress, the benefits to crowd management, security, and emergency medical personnel are obvious.

Current IBC aisle access requirements are based on seating with backrests. For the minimum 12” aisle access, 6 seats are allowed between any seat and an aisle. From there that number of seats is increased with increases in aisle access width and smoke protection. This proposal increases the basic number of seats between any seat and an aisle for the minimum 12” aisle access from 6 to 9(single access) or 10(dual access). The increase factors for width and smoke protection remain unchanged.

Once the increased number is exceeded in a dual access or single access row, the calculation for the increased access aisle width would start at this point. Example of dual access:

Seats with backs – 30 seats; 30 – 14 = 16; 16 x 0.3” + 12” = 16.8” minimum access aisle width
Seats without backs – 30 seats; 30 – 21 = 7; 7 x 0.3” + 12” = 14.1” minimum access aisle width

This proposal also re-introduces the long standing and time tested dead end aisle limit of 16 rows for non-smoke protected seating. The 16 row limit is reasonable considering the attentiveness of people and typically shorter periods of occupancy involved with assembly. It also matches well with the 21 row limit already afforded to smoke protected seating.

The purpose of the ICC 300 standard is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, and safety to life and property relative to the construction, alteration, repair, operation, and maintenance of new and existing temporary and permanent bench bleachers, folding and telescopic seating, and grandstands. Information can be downloaded from the following website: http://www.iccsafe.org/cs/standards/IS-BLE/Pages/default.aspx. Since its inception in March 2000, the committee has produced 3 editions, the latest edition being 2012. All meeting are open to the public.

Cost Impact: None

E160-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.9.5-E-CASELLA-ICC 300.doc

E161 – 12
1028.11.2.1(New) [IFC [B] 1028.11.2.1(New)]

Proponent: Ed Roether, Ed Roether Consulting, representing self (ed@edroetherconsulting.com)

Add new test as follows:

1028.11.2 (IFC [B] 1028.11.2) Risers. Where the gradient of aisle stairs is to be the same as the gradient of adjoining seating areas, the riser height shall not be less than 4 inches (102 mm) nor more than 8 inches (203 mm) and shall be uniform within each flight.

Exceptions:

1. Riser height nonuniformity shall be limited to the extent necessitated by changes in the gradient of the adjoining seating area to maintain adequate sightlines. Where nonuniformities exceed 3/16 inch (4.8 mm) between adjacent risers, the exact location of such nonuniformities shall be indicated with a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform risers. Such stripe shall be a minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide. The edge marking stripe shall be distinctively different from the contrasting marking stripe.
2. Riser heights not exceeding 9 inches (229 mm) shall be permitted where they are necessitated by the slope of the adjacent seating areas to maintain sightlines.

<u>**1028.11.2.1 (IFC [B] 1028.11.2.1) Construction Tolerances.** The tolerance between adjacent risers on an aisle stair that were designed to be equal height shall not exceed 3/16 inch (4.8 mm). Where the aisle stair is designed in accordance with Exception 1 of Section 1028.11.2, the aisle stair shall be constructed so that each riser of unequal height, determined in the direction of descent, is not more than 3/8 inch (10 mm) in height different from adjacent risers where aisle stair treads are less than 22 inches (560 mm) in depth and 3/4 inch (19 mm) in height different from adjacent risers where aisle stair treads are 22 inches (560 mm) or greater in depth.</u>

Reason: Construction tolerances are addressed elsewhere in the building code and the provisions of exception #1 should not support the lack of construction diligence on aisle construction. Without construction tolerance limits, each aisle riser could vary in height due to construction and stripe in accordance to exception #1 which nullifies the purpose of the striping to identify hazardous locations. Also, currently there is no maximum limit where riser heights vary and there should be. The limits of this proposal have been coordinated with the tolerances specified for cast-in-place concrete construction (ACI) and precast concrete construction (PCI).

Cost Impact: None

E161-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.11.2.1-E-Roether.doc

E162 – 12

1009.8, 1009.10, 1010.5, 1010.7, 1028.11.4 (New) [IFC [B] 1009.8, 1009.10, 1010.5, 1010.7, 1028.11.4 (New)]

Proponent: Ed Roether, Ed Roether Consulting, representing self (ed@edroetherconsulting.com)

Revise as follows:

<u>**1028.11.4 (IFC [B] 1028.11.4) Landings.** Landings for a ramped aisle that serve as part of an accessible route shall be constructed in accordance with Section 1010.7. Landings are not required at ramped aisles that are not part of an accessible route. Landings are not required at aisle stairs.</u>

1009.8 (IFC [B] 1009.8) Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum width measured perpendicular to in the direction of travel equal to the width of the stairway. Where the stairway has a straight run the depth need not exceed 48 inches (1219 mm). Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exception: <u>Landings are not required at </u>aisle stairs complying with Section 1028.

1009.10 (IFC [B] 1009.8) Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

1. <u>Landings are not required at </u>aisle stairs complying with Section 1028.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. Spiral stairways used as a means of egress from technical production areas.

1010.5 (IFC [B] 1010.5) Vertical rise. The rise for any ramp run shall be 30 inches (762 mm) maximum.

<u>**Exception:** Ramped aisles that are not part of an accessible route and complying with Section 1028.</u>

1010.7 (IFC [B] 1010.7) Landings. Ramps shall have landings at the bottom and top of each ramp, points of turning, entrance, exits and at doors. Landings shall comply with Sections 1010.7.1 through 1010.7.5.

<u>**Exception:** Landings are not required at ramped aisles that are not part of an accessible route and complying with Section 1028.</u>

Reason: Landing requirements for stairways and ramps conflict with the line of sight requirements of assembly seating, thereby aisle stairs and aisle ramps. This proposal clarifies that line of sight requirements integral with aisles and all of the provisions relating to aisles need to be covered in Section 1028. This proposal is intended to coordinate with another proposed change by the proponent addressing aisle transitions.

Cost Impact: Minimal

E162-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.11.4-E-Roether.doc

E163 – 12
1028.13 (IFC [B] 1028.13)

Proponent: Ed Roether, Ed Roether Consulting, representing self (ed@edroetherconsulting.com)

Revise as follows:

1028.13 (IFC [B] 1028.13) Handrails. Ramped *aisles* having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and *aisle stairs* shall be provided with *handrails* located either at the side or within the *aisle* width.

Exceptions:

1. *Handrails* are not required for ramped *aisles* having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. *Handrails* are not required if, at the side of the *aisle*, there is a *guard* that complies with the graspability requirements of *handrails*.
3. *Handrail* extensions are not required for ~~at the top and bottom of~~ *aisle stairs* ~~and~~ or *aisle ramps* ~~runs~~ to *permit* crossovers within the *aisles*. Handrail extensions are required at the top of an aisle terminating at a concourse.

Reason: Sometimes the top or bottom of an aisle is still within the aisle and other times it is at the end of an aisle. An aisle terminating at a concourse would always be at the end of an aisle, therefore crossover is not critical. Aisles terminating at a cross-aisle may or may not be at the end of an aisle, but there would be cross traffic along the cross-aisle. Aisles need to permit crossover at a foyer, doorway or vomitory. This proposal addresses only those locations where a crossover within the aisle is not a critical factor.

Cost Impact: Minimal

E163-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1028.13-E-Roether.doc

E164-12

1012.4, 1028.9.1, 1028.13.1, 1028.13.2; (IFC [B] 1012.4, 1028.9.1, 1028.13.1, 1028.13.2)

Proponent: Dan Casella, Chair, ICC 300 Development Committee, Standard for Bleachers, Folding and Telescopic Seating and Grandstands

Revise as follows:

1028.13 Handrails. Ramped *aisles* having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and *aisle stairs* shall be provided with *handrails* located either at the side or within the *aisle* width.

Exceptions:

1. *Handrails* are not required for ramped *aisles* having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. *Handrails* are not required if, at the side of the *aisle*, there is a *guard* that complies with the graspability requirements of *handrails*.
3. *Handrail* extensions are not required at the top and bottom of *aisle stairs* and *aisle ramps* to *permit* crossovers within the *aisles*.

1028.13.1 (IFC [B] 1028.13.1) Discontinuous handrails. Where there is seating on both sides of the aisle, the mid-aisle handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the mid-aisle handrail shall have rounded terminations or bends.

1028.13.2 (IFC [B] 1028.13.2) Handrail termination. Handrails located on the side of aisle stairs shall return to a wall, guard or the walking surfaces or shall be continuous to the handrail of an adjacent aisle stair flight.

1028.13.3 (IFC [B] 1028.13.3) Mid-aisle termination. Mid-aisle handrails shall not extend beyond the lowest riser and shall terminate within 18 inches (381 mm), measured horizontally, from the lowest riser. Handrail extensions are not required.
Exception: Mid-aisle handrails shall be permitted to extend beyond the lowest riser where the handrail extensions do not obstruct the width of the cross aisle.

~~1028.13.2~~ 1028.13.4 (IFC [B] ~~1028.13.2~~ 1028.13.4) Intermediate ~~hand~~rails. Where mid-aisle *handrails* are provided in ~~the middle of~~ *aisle stairs*, there shall be an additional intermediate rail ~~*handrail*~~ located approximately 12 inches (305 mm) below the ~~main~~ *handrail*.

1012.4 (IFC [B] 1012.4) Continuity. *Handrail* gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. *Handrails* within *dwelling units* are permitted to be interrupted by a newel post at a turn or landing.
2. Within a *dwelling unit*, the use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the *handrail* that do not project horizontally beyond the sides of the *handrail* within 11/2 inches (38 mm) of the bottom of the *handrail* shall not be considered obstructions. For each 1/2 inch (12.7 mm) of additional

handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 11/2 inches (38 mm) shall be permitted to be reduced by 1/8 inch (3 mm).

4. Where *handrails* are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.
5. Mid-aisle handrails in rooms or spaces used for assembly purposes in accordance with Section 1028.13.

1028.9.1 (IFC [B] 1028.9.1) Minimum aisle width. The minimum clear width for *aisles* shall be as shown:

1. Forty-eight inches (1219 mm) for *aisle stairs* having seating on each side.

   Exception: Thirty-six inches (914 mm) where the *aisle* serves less than 50 seats.

2. Thirty-six inches (914 mm) for *aisle stairs* having seating on only one side.

   Exception: Twenty-three inches (584 mm) between an *aisle stair handrail* and seating where an *aisle* does not serve more than five rows on one side.

3. Twenty-three inches (584 mm) between an *aisle stair handrail* or *guard* and seating where the aisle is subdivided by a mid-aisle *handrail*.
4. Forty-two inches (1067 mm) for level or ramped *aisles* having seating on both sides.

   Exceptions:

   1. Thirty-six inches (914 mm) where the *aisle* serves less than 50 seats.
   2. Thirty inches (762 mm) where the *aisle* does not serve more than 14 seats.

. 5. Thirty-six inches (914 mm) for level or ramped *aisles* having seating on only one side.

   Exception: Thirty inches (762 mm) where the *aisle* does not serve more than 14 seats.

Reason: There are three intents for this proposal. The breaks in mid-aisle handrails are a continuity issue, and there was not an exception for this in Section 1014.4. New Section 1028.13.1.2 will clarify how far that handrail can stop from the bottom of a aisle stair and still allow for a person to get past the front of the rail to enter the first row of seating. This is coordinated with revisions to ICC 300, Section 409.5.1. The rail below the handrail is to stop people from going under the handrail or swinging on the rail. It is not intended to meet all the handrail provisions for graspability. This is coordinated with ICC 300, Section 409.1.1.

Changes throughout are for consistency in using the term, mid-aisle handrail.

The purpose of the ICC 300 standard is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, and safety to life and property relative to the construction, alteration, repair, operation, and maintenance of new and existing temporary and permanent bench bleachers, folding and telescopic seating, and grandstands. Information can be downloaded from the following website: http://www.iccsafe.org/cs/standards/IS-BLE/Pages/default.aspx. Since its inception in March 2000, the committee has produced 3 editions, the latest edition being 2012. All meeting are open to the public.

Cost Impact: None

E164-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1012.4-E-CASELLA

E165-12

1009.16(New), 1010.11, 1013.2, 1013.3, 1028.14, 1028.14.1, 1028.14.2, 1028.14.3; (IFC [B] 1009.16(New), 1010.11, 1013.2, 1013.3, 1028.14, 1028.14.1, 1028.14.2, 1028.14.3)

Proponent: Dan Casella, Chair, ICC 300 Development Committee, Standard for Bleachers, Folding and Telescopic Seating and Grandstands

Revise as follows:

1028.14 (IFC [B] 1028.14) Assembly guards. Guards adjacent to seating in a building, room or space used for assembly purposes shall be provided where required by Section 1013 and shall be constructed in accordance with Section 1013 except where provided in accordance with ~~comply~~ Sections 1028.14.1 through 1028.14.~~3~~4. At bleachers, grandstands and folding and telescopic seating, guards must be provided where required by ICC 300 and Section 1028.14.1.

1028.14.1 (IFC [B] 1028.14.1) Perimeter guards. Perimeter guards shall be provided where the footboards or walking surface of seating facilities are more than 30 inches (762 mm) above the floor or grade below. Where the seatboards are adjacent to the perimeter, guard height shall be 42 inches (1067 mm) high minimum, measured from the seatboard. Where the seats are self-rising, guard height shall be 42 inches (1067 mm) high minimum, measured from the floor surface. Where there is an aisle between the seating and the perimeter, the guard height shall be measured in accordance with Section 1013.2.

Exceptions:

1. Guards that impact line-of-sight shall be permitted to comply with Section 1028.14.3.
2. Bleachers, grandstands and folding and telescopic seating shall not be required to have perimeter guards where the seating is located adjacent to a wall and the space between the wall the seating is less than 4 inches (102 mm).

~~1028.14.1~~ 1028.14.2 (IFC [B] ~~1028.14.1~~ 1028.14.2) Cross aisles. Cross aisles located more than 30 inches (762 mm) above the floor or grade below shall have guards in accordance with Section 1013.

Where an elevation change of 30 inches (762 mm) or less occurs between a cross aisle and the adjacent floor or grade below, guards not less than 26 inches (660 mm) above the aisle floor shall be provided.

Exception: Where the backs of seats on the front of the cross aisle project 24 inches (610 mm) or more above the adjacent floor of the aisle, a guard need not be provided.

~~1028.14.2~~ 1028.14.3 (IFC [B] ~~1028.14.2~~ 1028.14.3) Sightline-constrained guard heights. Unless subject to the requirements of Section ~~1028.14.3~~ 1028.14.4, a fascia or railing system in accordance with the guard requirements of Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. ~~At bleachers, a guard must be provided where required by ICC 300.~~

~~**Exception:** The height of the guard in front of seating shall be measured from the adjacent walking surface.~~

~~1028.14.3~~ 1028.14.4 (IFC [B] ~~1028.14.3~~ 1028.14.4) Guards at the end of aisles. A fascia or railing system complying with the guard requirements of Section 1013 shall be provided for the full width of the aisle where the foot of the aisle is more than 30 inches (762 mm) above the floor or grade below. The fascia or railing shall be a minimum of 36 inches (914 mm) high and shall provide a minimum 42 inches (1067 mm) measured diagonally between the top of the rail and the nosing of the nearest tread.

1009.16 (IFC [B] 1009.16) Guards. Guards shall be provided where required by Section 1013 and shall be constructed in accordance with Section 1013.

1010.10 ~~1010.11~~ (IFC [B] 1010.10 ~~1010.11~~) Guards. Guards shall be provided where required by Section 1013 and shall be constructed in accordance with Section 1013.

1013.2 (IFC [B] 1013.2) Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanines*, *equipment platforms*, aisles, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.8.

Exception: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including ~~steps~~ stairways leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of stages and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where *guards* in accordance with Section 1028.14 are permitted and provided.

1013.3 (IFC [B] 1013.3) Height. Required guards shall not be less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces,
2. On ~~stairs~~ stairways and aisle stairs, from the line connecting the leading edges of the tread nosings, and
3. On ramps and ramped aisles, from the ramp surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual dwelling units in occupancies in Group R-2 not more than three stories above grade in height with separate means of egress, required guards shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces or fixed seating.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
3. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
4. The guard height in assembly seating areas shall comply with Section 1028.14 as applicable.
5. Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: The intent is to deal with guards consistently for stairways, ramps and aisles (level, stepped and ramped). The situations unique to assembly seating will be addressed in 1028: at the outside perimeter; at cross aisles; where sightline-constraints are present; and at the end of the aisle. Guards at other locations will be address by the general provisions in Section 1013.

The 2012 ICC 300 does not include provisions for perimeter guards. It is the intent of the ICC 300 bleacher committee to propose the perimeter guard requirement into the bleacher standard during the next update cycle.

- 1009.16 – Add language to require guards at sides of stairways the same as at ramps.
- 1010.10 – Relocate guard requirement at ramps to immediately follow handrails. The handrails and guards should work as a unit.
- 1013.2 – Add aisles to the general requirements so that raised aisles that are not specifically addressed in Section 1028.14 are also be required to have guards.
- 1013.3 – Add aisle descriptors so that the guard height is 42" for aisles unless specifically addressed in Section 1028.14. An example would be side aisles.
- 1028.14 –The reference back to Section 1013 for guard construction is consistent with stairways and ramps. This will address situation other than that covered by subsections. The allowance to use ICC 300 is a general reference for similar guard situation, so it was relocated from 1028.14.2.
- 1028.14.1 (new) – There is a question regarding where guards are required around the perimeter of assembly seating since the walking surface for the last row of seating is not immediately adjacent to a drop off. This question exists for ICC 300 and other assembly seating arrangements. ICC 300 requires guards with 4" openings where the floor surface has an adjacent 30" drop off (ICC 300 Section 408). The dropoff is measure from the floor rather than the seatboard because the ICC 300 committee did not feel it was appropriate to require guards in a two or three row bleacher system. The guard height would be measured from the seatboard to address when people stand on the seats. Where seats are self rising, the guard height would be measured from the floor. Self-rising seats have backs and are very difficult to stand on.
  - Exception 1 is to allow for the limited situation where the guards at the sides of the seating may possible affect the line-or-sight in wide venues.
  - Exception 2 will permit bleacher systems constructed inside the building to use the building walls are perimeter guards if the opening between the bleacher and the wall is less than the opening permitted for guards.
- 1028.14.2 (renumbered 1028.14.3) – The allowance to look at ICC 300 for guards is relocated to the general guard requirement in 1028.14. The exception is not required for two reasons – guard height measured from the seat is addressed in the new section for perimeter guards in 1028.14.1 and the existing text in 1028.14.2 does not require measurement from the seatboard in front of the first balcony row.

The purpose of the ICC 300 standard is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, and safety to life and property relative to the construction, alteration, repair, operation, and maintenance of new and existing temporary and permanent bench bleachers, folding and telescopic seating, and grandstands. Information can be downloaded from the following website: http://www.iccsafe.org/cs/standards/IS-BLE/Pages/default.aspx. Since its inception in March 2000, the committee has produced 3 editions, the latest edition being 2012. All meeting are open to the public.

Cost Impact: None

E165-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.16-E-CASELLA-ADHOC.doc

E166 – 12
1029.1 (IFC [B] 1029.1)

Proponent: Arlan Smith, representing Idaho Division of Building Safety (mrlan.smith@dbs.idaho.gov)

Revise as follows:

1029.1 (IFC [B] 1029.1) General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue openings in Group R-2 occupancies in accordance with Tables 1021.2(1) and 1021.2(2) and Group R-3 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency escape and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way.

Exceptions:

1. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue openings.
~~2.~~ ~~Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens directly into a public way or to a yard, court or exterior exit balcony that opens to a public way.~~
~~3~~2. Basements without habitable spaces and having no more than 200 square feet (18.6 m2) in floor area shall not be required to have emergency escape and rescue openings.

Reason: The door described in exception number 2 is an emergency escape and rescue opening. Nothing is the section suggests that a single opening cannot be both the required means of egress and the required emergency escape and rescue opening. There is no need for this exception.

Cost Impact: None

E166-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1029.1-E-SMITH

E167-12
1101.1, 1103.1, E101.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1101.1 Scope. The provisions of this chapter shall control the design and construction of facilities for accessibility for individuals with disabilities ~~to physically disabled persons~~.

1103.1 Where required. Sites, buildings, structures, facilities, elements and spaces, temporary or permanent, shall be accessible to individuals ~~persons~~ with ~~physical~~ disabilities.

E101.1 Scope. The provisions of this appendix shall control the supplementary requirements for the design and construction of facilities for *accessibility* for individuals with disabilities ~~to physically disabled persons~~.

Reason: The intent of this provision is to revise for more correct 'people first' language. (ADA 201.1)

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E167-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.1- E-BALDASSARRA-CTC.docx

E168-12
1103.2.3-1103.2.15

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1103.2 General exceptions. Sites, buildings, structures, facilities, elements and spaces shall be exempt from this chapter to the extent specified in this section.

1103.2.1 Specific requirements. Accessibility is not required in buildings and facilities, or portions thereof, to the extent permitted by Sections 1104 through 1110.

1103.2.2 Existing buildings. Existing buildings shall comply with Section 3411.

1103.2.3 Employee work areas. Spaces and elements within employee work areas shall only be required to comply with Sections 907.5.2.3.2, 1007 and 1104.3.1 and shall be designed and constructed so that individuals with disabilities can approach, enter and exit the work area. Work areas, or portions of work areas, other than raised courtroom stations in accordance with Section 1108.4.1.4, that are less than 300 square feet (30 m^2) in area and located 7 inches (178 mm) or more above or below the ground or finish floor where the change in elevation is essential to the function of the space shall be exempt from all requirements.

1103.2.4 Detached dwellings. Detached one- and two- family dwellings, ~~and~~ their accessory structures, and their associated sites and facilities, are not required to ~~be accessible~~ comply with this Chapter.

1103.2.5 Utility buildings. ~~Occupancies in~~ Group U occupancies are not required to comply with ~~exempt from the requirements of~~ this chapter other than the following~~:~~

1. In agricultural buildings, access is required to paved work areas and areas open to the general public.
2. Private garages or carports that contain required accessible parking.

1103.2.6 Construction sites. Structures, sites and equipment directly associated with the actual processes of construction including, but not limited to, scaffolding, bridging, materials hoists, materials storage or construction trailers are not required to ~~be~~ comply with this Chapter.

1103.2.7 Raised areas. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands are not required to ~~be accessible or to be served by an accessible route~~ comply with this Chapter.

1103.2.8 Limited access spaces. ~~Nonoccupiable~~ Spaces accessed only by ladders, catwalks, crawl spaces, freight elevators or very narrow passageways are not required to ~~be accessible~~ comply with this Chapter.

1103.2.9 Equipment spaces. Spaces frequented only by service personnel for maintenance, repair or occasional monitoring of equipment are not required to ~~be accessible~~ to comply with this Chapter. ~~Such spaces include, but are not limited to, elevator pits, elevator penthouses, mechanical, electrical or communications equipment rooms, piping or equipment catwalks, water or sewage treatment pump rooms and stations, electric substations and transformer vaults, and highway and tunnel utility facilities.~~

1103.2.10 Single-occupant structures. Single-occupant structures, accessed only by passageways below grade or above grade including, but not limited to, toll booths that are accessed only by underground tunnels, are not required to ~~be accessible~~. comply with this Chapter.

1103.2.11 Residential Group R-1. Buildings of Group R-1 containing not more than five *sleeping unit*s for rent or hire that are also occupied as the residence of the proprietor are not required to ~~be *accessible*~~ comply with this Chapter.

1103.2.12 Day care facilities. Where a day care facility is part of a *dwelling unit*, only the portion of the structure utilized for the day care facility is required to be accessible.

1103.2.13 Live/work units. In live/work units constructed in accordance with Section 419, the portion of the unit utilized for nonresidential use is required to be *accessible*. The residential portion of the live/work unit is required to be evaluated separately in accordance with Sections 1107.6.2 and 1107.7.

1103.2.14 Detention and correctional facilities. In detention and correctional facilities, *common use* areas that are used only by inmates or detainees and security personnel, and that do not serve holding cells or housing cells required to be ~~*accessible*~~ Accessible units, are not required to ~~be *accessible* or to be served by an *accessible route*~~ comply with this Chapter.

1103.2.15 Walk-in coolers and freezers. Walk-in coolers and freezers intended for employee use only are not required to ~~be accessible~~ comply with this Chapter.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The purpose of this proposal is to clarify how these exceptions are applied.

1103.2.3 - Courtrooms work stations are more specifically addressed in 1108.4.1.4. (ADA 203.9)
1103.2.4 - This change is to provide consistency in language between sections by changing “to be accessible” with “comply with this chapter”. (not in ADA)
1103.2.5 - Consistency in language between sections. (not in ADA)
1103.2.6 - Consistency in language between sections. (ADA 203.2)
1103.2.7 - Consistency in language between sections. (ADA 203.3)
1103.2.8 – The term “non-occupiable” is not needed because areas accessed only by these methods cannot be occupiable spaces by definition. The second change is for consistency in language between sections. Furthermore the ADA does not require the area to be non-occupiable and intends to allow this to be okay for areas such as stage lighting and sound catwalks (ADA 203.4)
1103.2.9 - The performance language is made clearer and intended to keep this exception from being used for areas that are regularly staffed and could be staffed by a person with disabilities. The laundry list is not needed with the improved performance language and is proposed to be removed. Lastly the consistent terminology was added. (ADA 203.5)
1103.2.10 - Consistency in language between sections. (ADA 203.6)
1103.2.11 - Consistency in language between sections. (ADA definition of Transient Lodging threshold)
1103.2.14 - Consistency in terminology for the section. In addition, jails are only required to have Accessible units in accordance with Section 1107.5.5. This would also be more consistent with the ADA reference (ADA 203.7).
1103.2.15 - Consistency in language between sections (not in ADA).

The intent is for this proposal to correlate with other proposals to revise, remove or relocate specific exceptions.

Cost Impact: None

E168-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2-E-BALDASSARRA-CTC.docx

E169-12
1103.2.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Delete without substitution:

~~**1103.2.2 Existing buildings.** Existing buildings shall comply with Section 3411.~~

Reason: This exception is being deleted because it is not needed. Application of the building code for existing buildings begins in chapter 34. The scope of accessibility requirements for existing buildings is specified in chapter 34, specifically in section 3411. IBC chapter 11 is not the scoping chapter for existing building accessibility, therefore this exception in chapter 11 is simply redundant and not needed. It is technically an invalid exception because it is a scoping exception for a chapter that does not scope accessibility for existing buildings. Other chapters of the IBC do not have a similar exception because the general scope of the IBC is for new construction with Chapter 34 applicable to scope the IBC or IEBC for existing construction. The general scope of application of the IBC and IEBC to existing buildings is established in IBC Chapter 34; the IEBC as referenced by IBC section 3401.6 as an alternative to IBC chapter 34.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E169-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.2-E-BALDASSARRA-CTC.docx

E170 – 12
1103.2.8

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1103.2.8 Limited access spaces. Nonoccupiable spaces accessed only by ladders, catwalks, crawl spaces, freight elevators, ~~or~~ very narrow passageways or tunnels are not required to be *accessible*.

Reason: The proposed additional language will clarify an additional nonoccupiable space within a building previously not listed.

Cost Impact: The code change proposal will not increase the cost of construction.

E170-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.8-E-Dahmen.doc

E171-12/13
1103.2.8 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Add text as follows:

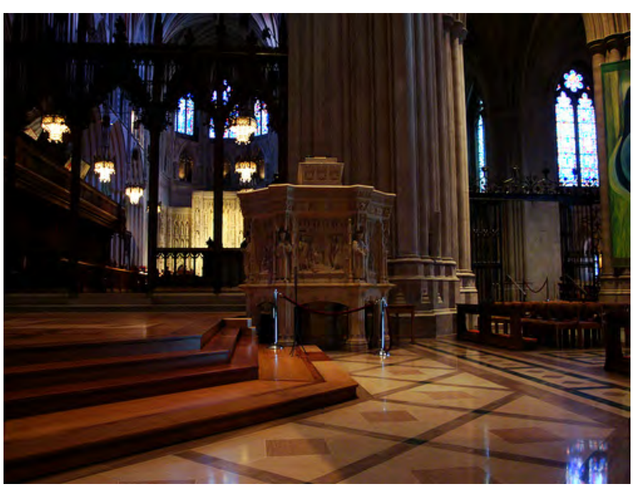
1103.2.8 Areas in places of religious worship. Raised or lowered areas, or portions of areas, in places of religious worship that are less than 300 sq.ft. (30 m^2) in area and located 7 inches or more (178 mm) or more above or below the finished floor and used primarily for the performance of religious ceremonies are not required to comply with this chapter.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The IBC requires religious buildings to be fully accessible. Many religious architectural building features based on traditions and rituals result in raised areas or recessed areas within the sanctuary or worship area. It can be difficult, beyond a reasonable accommodation, to provide full accessibility to these raised and lowered areas for religious use. Some examples of these types of architectural features are: Altars, bimahs, baptisteries, pulpits, minbars, and minarets. Some pictures of these features are provided below. An additional issue is the Americans with Disabilities act section 307 exempts' religious organizations and religions buildings (the entire building) from compliance with the act. Do to the ADA exemption accessibility to specific church architectural elements such as those listed above have never been developed and are not specifically addressed in the ADA, A117.1 standard, or IBC. Therefore, even if an accessible route is provided to these areas there is no guidance in the A117.1 standard as to how to make a religious feature such as a baptistery accessible. This proposed exception is similar to the practical allowances already permitted for raised employee areas in courtrooms, raised employee work areas, and raised areas within some sports facilities (i.e., referee stands). The proposed Section 1103.2.8 would exempt reasonably sized areas in recognition of the religious practices and traditions incorporated into the religious architectural features common in religious architecture. A similar change was submitted during the 09/10 code development cycle (E158 09/10). The Egress Committee denied the code change and stated in their reason that such an exemption has merit but a size limitation was needed. To respond to the committee comment a 300 square foot area limitation was added. The 300 square foot area is based on the employee work area exemption area limit (IBC 1103.2.3).

Report of the hearings for E158 09/10:

E158-09/10
Committee Action: Disapproved
Committee Reason: While there should be allowances for some areas within a church, there needs to be some sort of size limitations. A possible interpretation could be that the entire church was used for religious ceremonies, which is not consistent with the intent of the proponent.



Raised pulpit in Washington cathedral.

Minbar in mosque.

Full immersion baptisteries in Baptist or Greek orthodox.

High alter in Greek orthodox.

Raised area in synagogue for torah

Cost Impact: None

E171-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.8-E-BALDASSARRA-CTC.docx

E172 – 12
1103.2.9 (New)

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Add new text as follows:

1103.2.9 Storage spaces. Storage spaces that do not include permanent workstations, are infrequently accessed by employees, and are not open to the general public are not required to be accessible.

Reason: The proposed language will clarify accessibility limitations as addressed by ADAAG within the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

E172-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.8.1-E-Dahmen.doc

E173-12
1103.2.10

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1103.2.10 Highway toll-booths ~~Single-occupant structures.~~ Highway toll-booths where the access is only provided by bridges above the vehicular traffic or underground tunnels, are not required to comply with this Chapter. ~~Single-occupant structures, accessed only by passageways below grade or above grade including, but not limited to, toll booths that are accessed only by underground tunnels, are not required to be accessible.~~

Reason: This exception was based on ADA section 203.6. The intent of the federal exception was that it apply exclusively to highway toll booths. The problem with the current IBC text is that this exception is currently miss-used for a variety of structures that were not intended to be exempted. Since the intent of the exception was specific to toll booths that required access from above or below the highway, and that are typically elevated on a curb, this proposal changes the exception be specific to highway toll booths.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E173-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.10-E-BALDASSARRA-CTC.docx

E174-12
1103.2.12

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Delete without substitution:

~~**1103.2.12 Day care facilities.** Where a day care facility is part of a *dwelling unit*, only the portion of the structure utilized for the day care facility is required to be accessible.~~

Reason: This exception is invalid within the context of the IBC. A day care facility cannot be part of a dwelling unit because they are two distinct occupancies. If a day care facility and a dwelling unit are in the same building then the building is a mixed occupancy building and the accessibility provisions for each occupancy are applicable, and no exception is required or appropriate. The dwelling unit portion would be a Group R-2 or R-3; the day care facility would be Group I-4, I-2 or E. Accessibility requirements would be scoped to each occupancy group accordingly.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E174-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.12-E-BALDASSARRA-CTC.docx

E175-12
1103.2.13, 1107.6.2.1, 1107.6.2.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

~~1103.2.13~~ 1107.6.2.1 Live/work units. In live/work units constructed in accordance with Section 419, the nonresidential portion ~~of the unit utilized for nonresidential use~~ is required to be *accessible*. In a structure, where there are four or more live/work units intended to be occupied as a residence, the residential portion of the live/work unit ~~is required to be evaluated separately in accordance with Sections 1107.6.2 and 1107.7~~ shall be a Type B unit.

> **Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

~~1107.6.2.1~~ 1107.6.2.2 Apartment houses, monasteries and convents. *(no change to text)*

~~1107.6.2.2~~ 1107.6.2.3 Group R-2 other than live/work units, apartment houses, monasteries and convents. In Group R-2 occupancies, other than live/work units, apartment houses, monasteries and convents not falling within the scope of Section 1107.6.2.1 and 1107.6.2, Accessible units and Type B units shall be provided in accordance with Sections 1107.6.2.2.1 and 1107.6.2.2.2.

Reason: This section regarding live/work units is not an exception, it provides specific requirements for accessibility in live/work units, and therefore the section is incorrectly located in the general exceptions section. This code change will move the section to the appropriate section within chapter 11. Since a Live/work unit is a Group R-2 occupancy, the provisions should be grouped with R-2 dwelling unit requirements in section 1107. The change to the first sentence is just to simplify the sentence by replacing seven words with one. The change to the second sentence and added exception accomplishes the same thing as the current reference to Section 1107.6.2 and 1107.7 but provides the requirements and exceptions for Type B units in the section so that the code user does not need to go the referenced sections to discover the four unit threshold for Type B unit requirements.

The changes to 1107.6.2.2 are correlative due to the relocation of 1103.2.13.

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Cost Impact: None

E175-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.13-E-BALDASSARRA-CTC.docx

E176 – 12
1103.2.16 (New)

Proponent: David R. Scott, AIA, representing Target Corporation (David.Scott@Target.com)

Add new text as follows:

<u>**1103.2.16 Display areas.** Display areas that do not exceed 300 square feet (30 m^2) in area and are not open to the public are not required to be accessible.</u>

Reason: Access to these display areas are not intended by the general public. We feel Section 1103.2.8 Limited access spaces, do not clearly identify that display areas would fall under this section. We have established a size of 300 sq. ft. to give a limit to a size of a display area as well as to tie into the size established in Section 1103.2.3.

Cost Impact: The code change proposal will not increase the cost of construction.

E176-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.2.16 (new)-E-Scott.doc

E177-12
1104.1, 1104.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1104.1 Site arrival points. At least one accessible ~~routes~~ route within the site shall be provided from public transportation stops; accessible parking; accessible passenger loading zones; and public streets or sidewalks to the accessible building entrance served.

1104.3 Connected spaces. When a building or portion of a building is required to be accessible, ~~an~~ at least one accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and to the public way.

Reason: Adding 'at least one' would clarify that one route is to be accessible, not necessarily every route. This is consistent with ADA 206.2.1 and 206.2.4.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E177-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.1-E-BALDASSARRA-CTC.docx

E178-12
1104.3, 1104.4

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1104.3 Connected spaces. When a building or portion of a building is required to be *accessible*, an *accessible route* shall be provided to each portion of the building, to *accessible* building entrances connecting *accessible pedestrian walkways* and the *public way*.

Exceptions:

1. Stories and mezzanines exempted by Section 1104.4.
~~1~~2. In a building, room or space used for assembly purposes with *fixed seating*, an *accessible route* shall not be required to serve levels where *wheelchair spaces* are not provided.
~~2~~3. In Group I-2 facilities, doors to *sleeping unit*s shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.
4. Vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a *ramp*, lift or elevator can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

1104.4 Multilevel buildings and facilities. At least one *accessible route* shall connect each *accessible* ~~level~~ story~~, including mezzanines~~ and *mezzanine*, in multilevel buildings and facilities.

Exceptions:

1. An *accessible route* is not required to stories and *mezzanines* that have an aggregate area of not more than 3,000 square feet (278.7 m^2) and are located above and below *accessible* levels. This exception shall not apply to:
   1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces used for the sales or rental of goods and where at least one such tenant space is located on a floor level above or below the accessible levels;
   1.2. ~~Levels~~ Stories or mezzanines containing offices of health care providers (Group B or I); or
   1.3. Passenger transportation facilities and airports (Group A-3 or B).
   1.4 Government buildings.
2. ~~Levels~~ Stories or mezzanines that do not contain *accessible* elements or other spaces as determined by Section 1107 or 1108 are not required to be served by an *accessible route* from an *accessible* level.
3. In air traffic control towers, an *accessible route* is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one *story* or mezzanine with an *occupant load* of five or fewer persons that does not contain *public use* space, that *story* or mezzanine shall not be required to be connected by an *accessible route* to the *story* above or below.
5. ~~Vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a *ramp*, lift or elevator can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.~~

Reason: The intent is to address vertical access within a floor, and between stories. The committee proposes to provide exceptions consistent with 2010 ADA with the exception of the 2nd story limitation currently in the code (1104.3 Exception 1).

Therefore, this proposal is to coordinate with ADA accessibility provisions that are less than currently in IBC or more specifically addressed than in IBC. Sections 1104.3 is intended to deal with connecting all accessible spaces, with a reference to 1104.4 for changes in elevation of a story or to a mezzanine. Section 1104.4 addresses changes in elevation where typically the route is via an elevator. There is a similar proposal for coordination between Sections 1107.3 and 1107.4.

Specific reasons for each revision are as follows:

- 1104.3 Connected spaces –
  - New exception 1 is coordination with the 'elevator' exception between mezzanines and stories in Section 1104.4. (ADA 206.2.4 main text and Exp. 3)
  - Current exception 1, now exception 2, addresses tiered seating in assembly areas that comply with 1108 for wheelchair spaces and dispersion. (ADA 206.2.4, Exp. 2)
  - Current exception 2, new Exception 3 – Coordination with ADA 404.2.4 Exception for maneuvering clearance at Group I-2 hospital doors is addressed in a separate proposal.
  - New exception 4 – relocated from 1104.4 exception 5, since courtroom access is a level change, not a story change (AD 206.2.4, exp. 1).
- 1104.4 Multilevel buildings and facilities – An accessible route must connect stories and mezzanine. The intent is for this section to mainly deal with changes that typically use an elevator (ADA 206.2.3). The ADA and IBC refer to stories and mezzanines with a difference in terminology.
  - Exception 1.1 – further coordination with the ADA description of shopping mall or shopping center and the intent of this limitation to apply only to when a tenant is only on a non-accessible level. (ADA 206.2.3. Exp. 1)
  - Exception 1.2 – clarifies the terminology differences between ADA and IBC for mezzanines
  - Exception 1.4 – the intent is to address Title II buildings and/or public entities without having to go into funding issues. The description does not have to be as extensive because the IBC 2nd floor exception is much smaller than ADA Title III.
  - Exception 2 – clarifies the terminology differences between ADA and IBC for mezzanines
  - Exception 5 – relocated to 1104.3

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Cost Impact: None

E178-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.3 #1-E-BALDASSARRA-CTC.docx

E179-12
1104.3, 1107.3, 1107.5.3.1

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1104.3 Connected spaces. When a building or portion of a building is required to be *accessible*, an *accessible route* shall be provided to each portion of the building, to *accessible* building entrances connecting *accessible pedestrian walkways* and the *public way*.

Exception~~s~~:

~~1.~~ In a building, room or space used for assembly purposes with *fixed seating*, an *accessible route* shall not be required to serve levels where *wheelchair spaces* are not provided.

~~2. In Group I-2 facilities, doors to *sleeping units* shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.~~

1107.3 Accessible spaces. Rooms and spaces available to the general public or available for use by residents and serving *Accessible units*, *Type A units* or *Type B units* shall be *accessible*. *Accessible* spaces shall include toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies.

Exception~~s~~:

~~1.~~ Recreational facilities in accordance with Section 1109.15.

~~2. In Group I-2 facilities, doors to *sleeping units* shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.~~

1107.5.3 Group I-2 hospitals. *Accessible units* and *Type B units* shall be provided in general-purpose hospitals, psychiatric facilities and detoxification facilities of Group I-2 occupancies in accordance with Sections 1107.5.3.1 and 1107.5.3.2.

1107.5.3.1 Accessible units. At least 10 percent, but not less than one, of the *dwelling units* and *sleeping units* shall be *Accessible units*.

Exception: Entry doors to Accessible dwelling or sleeping units shall not be required to provide the maneuvering clearance beyond the latch side of the door.

Reason: The intent of the proposal is for coordination with the 2010 ADA Standard of Accessible Design for hospital doors. The 2010 ADA includes the following.

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

EXCEPTION: Entry doors to hospital patient rooms shall not be required to provide the clearance beyond the latch side of the door.

The current IBC text is written for all Group I-2 while the ADA requirements have exceptions for hospitals. The exception for the maneuvering clearances do not match ADA. By relocating the requirement as an exception specifically for the rooms which are required to be Accessible (Section 1107.5.3.1), it is clear that the entrances to the Accessible patient sleeping rooms are the rooms that can use the exception, as well making it clear that the intent is to allow these rooms to not meet the unit entry requirements in ICC A117.1 Section 1002.5.

Patients in hospitals are typically moved around the hospitals on stretchers or gurney's and if not, they are accompanied by staff when being moved in wheelchairs. The ADA recognized this difference in hospitals and included an exception. At this time, the ICC A117.1 does not include an exception specific to hospital room doors.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E179-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.3-E-Williams-Adhoc.docx

E180-12
1104.3.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1104.3.2 Press boxes. Press boxes in a building, room or space used for assembly purposes shall be on an accessible route.

Exceptions:

1. An accessible route shall not be required to press boxes in bleachers that have a single point ~~points~~ of entry ~~at~~ ~~only one level~~ from the bleachers, provided that the aggregate area of all press boxes for each playing field is not more than 500 square feet (46 m^2) ~~maximum~~.
2. An accessible route shall not be required to free-standing press boxes that are ~~elevated~~ more than ~~above grade~~ 12 feet (3660 mm) above grade ~~minimum~~ provided that the aggregate area of all press boxes for each playing field is not more than 500 square feet (46 m^2) ~~maximum~~.

Reason: This proposed change takes into consideration the intent of the ADA requirements and adds language consistent with that intent but clarifies the intended limitations of the exceptions. It should be noted however, that remaining questions exist regarding press boxes. For example what constitutes a "press box"? Would a small raised platform used by an announcer at a small community softball field be considered a press box? What if that raised platform is less than 50 sq. ft. in area, but accessed by a ladder and less than 12 ft. above grade? A "press box" is undefined. The intent of these exceptions relates to a more substantial "press box", and these proposed changes address questions that have been raised about those "press boxes". (*ADA 206.2.7)*

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Cost Impact: None

E180-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.3.2-E-BALDASSARRA-CTC.docx

E181-12
1104.4

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings and facilities.

Exception:

1 through 4. *(No change to text)*

5. Vertical access to elevated employee work stations within a courtroom ~~is not required at the time of initial construction, provided a ramp, lift or elevator can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.~~ complying with Section 1108.4.1.4.

Reason: The intent of this proposal is remove redundant text and to coordinate with Section 1108.4.1.4. There is no technical change. This allowance is addressed in ADA 206.2.4 Exception 1.

Section 1108.4.1.4 reads as follows:

1108.4.1.4 Employee work stations. The judge's bench, clerk's station, bailiff's station, deputy clerk's station and court reporter's station shall be located on an accessible route. The vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E181-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.4-E-BALDASSARRA-CTC.docx

E182-12
1105.1.6, 1105.1.7 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1105.1.6 Tenant spaces, ~~dwelling units and sleeping units~~. At least one accessible entrance shall be provided to each tenant, ~~dwelling unit and sleeping unit~~ in a facility.

Exceptions~~s~~:

~~1.~~ An accessible entrance is not required to self-service storage facilities ~~tenants~~ that are not required to be accessible.
~~2. An accessible entrance is not required to dwelling units and sleeping units that are not required to be Accessible units, Type A units or Type B units.~~

1105.1.7 Dwelling units and sleeping units. At least one accessible entrance shall be provided to each dwelling unit and sleeping unit in a facility.

Exception: An accessible entrance is not required to dwelling units and sleeping units that are not required to be Accessible units, Type A units or Type B units.

Reason: Grouping tenant spaces, dwelling and sleeping spaces together in this section has created some unintended confusion related to this section and other provisions. Some users of the code have referred to this section as an indication that "tenant" means a tenant in an apartment building also and have misapplied provisions intended specifically for commercial buildings.

The term "tenant" is not used in the code or in the federal rules or law to relate to residential conditions. By separating the terms, the misapplication will be eliminated.

The exception was added to distinguish the limitations related to units in self-storage facilities consistent with Section 1108.3 and the 2010 ADA Standards..(ADA 206.4.5) This will cause no conflict with Fair Housing.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E182-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1105.1.6-E-BALDASSARRA-CTC.docx

E183-12
1106.1, 1106.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1106.1 Required. Where parking is provided, accessible parking spaces shall be provided in compliance with Table 1106.1, ~~except~~ and as required by Sections 1106.2 through 1106.4. Where more than one parking facility is provided on a site, the number of parking spaces required to be accessible shall be calculated separately for each parking facility.

1106.2 Groups I-1, R-1, R-2 and R-4 ~~R-2 and R-3~~. In addition to the parking required by Table 1106.1, in Groups I-1, R-1, R-2 and R-4, where parking is provided for Accessible and Type A units, at least one accessible parking space shall be provided for each unit. ~~At least 2 percent, but not less than one, of each type of parking space provided for occupancies in Groups R-2 and R-3, which are required to have Accessible, Type A or Type B dwelling or sleeping units, shall be accessible.~~ Where parking is provided within or beneath a building, accessible parking spaces shall also be provided within or beneath the building.

1106.3 Hospital outpatient facilities. At least 10 percent, but not less than one, of care recipient and visitor parking spaces provided to serve hospital outpatient facilities shall be accessible.

1106.4 Rehabilitation facilities and outpatient physical therapy facilities. At least 20 percent, but not less than one, of the portion of care recipient and visitor parking spaces serving rehabilitation facilities specializing in treating conditions that affect mobility and outpatient physical therapy facilities shall be accessible.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

When parking is provided for residents, this proposal would require an accessible space for each Accessible and Type A unit, as well as accessible parking for the remainder of the units. This should meet both ADA and FHA. Literally, current IBC is asking for 2% of the parking provided for the three types of accessible units. 2010 ADA requires 2% of parking for all units that are not Accessible or Type A only when there is more than one parking space per unit. Table 1106.1 already gets you more than 2%. (2010 *ADA 208.3.2)*

Since Accessible units also required in Group I-1 assisted living, and these facilities may provide parking for residents, this Group has been added to the list. If the assisted living facility does not provide parking spaces for residents, the parking lots would just meet the general parking lot requirements.

Section 1106.3 and 1106.4 are relevant to only portions of the parking facilities for hospitals and rehabilitation facilities. Areas such as employee parking should use Table 1106.1 for the number of accessible spaces.

Cost Impact: None

E183-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1106.1#2-E-BALDASSARRA-CTC.docx

E184 – 12
1106.6 (New)

Proponent: Alan Manche, P.E., Schneider Electric representing self

Add new text as follows:

<u>**1106.6 Electric Vehicle Charging.** Where electrical vehicle charging stations are provides, and more than 250 total parking spaces are provided, not less than one accessible space shall be served with an electric vehicle charging station. An electric vehicle charging station shall serve an additional accessible parking space for each additional 500 parking spaces or fraction thereof.</u>

(Renumber subsequent sections)

Reason: Electric Vehicle Charging Stations are currently not location restricted and may not be located near an entrance providing accessibility. This code language seeks to provide electric vehicle charging for those with accessible needs that may choose to own an electric or plug-in hybrid car. The 250 parking space trigger seeks to provide electric vehicle charging for those parking lots with a high probably of an electric vehicle visiting the location. It also seeks to ensure those needing accessible parking are able to use their electric vehicle without being challenged by the location of those chargers. It should also be noted that proper placement of an electric vehicle charging station can also provide charging for other than accessible parking spaces, hence the reason for using the term “serve.”

Cost Impact: The code proposal will increase construction cost for large commercial facilities with a large parking space. The 250 parking space requirement limits cost impact to small business.

E184-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1106.8-E-Manche.doc

E185-12
1107.3, 1107.4, 1109.8

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1107.3 Accessible spaces. Rooms and spaces available to the general public or available for use by residents and serving *Accessible units*, *Type A units* or *Type B units* shall be *accessible*. *Accessible* spaces shall include toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies.

Exceptions:

1. Stories and mezzanines exempted by Section 1107.4.
2~~1.~~ Recreational facilities in accordance with Section 1109.15.
3~~2.~~ In Group I-2 facilities, doors to *sleeping unit*s shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.
4. Exterior decks, patios or balconies that are part of *Type B units* and have impervious surfaces, and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the unit.

1107.4 Accessible route. At least one *accessible route* shall connect *accessible* building or facility entrances with the primary entrance of each *Accessible unit*, *Type A unit* and *Type B unit* within the building or facility and with those exterior and interior spaces and facilities that serve the units.

Exceptions:

1. If due to circumstances outside the control of the owner, either the slope of the finished ground level between *accessible* facilities and buildings exceeds one unit vertical in 12 units horizontal (1:12), or where physical barriers or legal restrictions prevent the installation of an *accessible route*, a vehicular route with parking that complies with Section 1106 at each *public* or *common use* facility or building is permitted in place of the *accessible route*.
~~2. Exterior decks, patios or balconies that are part of *Type B units* and have impervious surfaces, and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the unit.~~
2. In Group I-3 facilities, an accessible route is not required to connect stories or mezzanines where Accessible units, all common use areas serving Accessible units and all public use areas are on an accessible route.
3. In Group R-2 facilities with Type A units complying with Section 1107.6.2.1.1 an accessible route is not required to connect stories or mezzanines where Type A units, all common use areas serving Type A units and all public use areas are on an accessible route.
4. In other than Group R-2 dormitory housing provided by places of education, in Group R-2 facilities with Accessible units complying with Section 1107.6.2.2.1 an accessible route is not required to connect stories or mezzanines where Accessible units, all common use areas serving Accessible units and all public use areas are on an accessible route.
5. In Group R-1 an accessible route is not required to connect stories or mezzanines within individual units, provided the accessible level meets the provisions for Accessible units and sleeping accommodations for two persons minimum and a toilet facility are provided on that level.
6. In Group R-3 and R-4 congregate residences, an accessible route is not required to connect floors or mezzanines where Accessible units or Type B units, all common use areas serving Accessible units and Type B units and all public use areas serving Accessible and Type B units are on an accessible route.

7. An accessible route between stories is not required where Type B units are exempted by Sections 1107.7.

1109.8 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required *accessible route* in new construction where indicated in Items 1 through 10. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An *accessible route* to a performing area and speaker platforms in Group A occupancies.
2. An *accessible route* to *wheelchair spaces* required to comply with the *wheelchair space* dispersion requirements of Sections 1108.2.2 through 1108.2.6.
3. An *accessible route* to spaces that are not open to the general public with an *occupant load* of not more than five.
4. An *accessible route* within ~~a~~ an individual *dwelling* or *sleeping unit* required to be an Accessible unit, Type A unit or Type B unit.
5. An *accessible route* to wheelchair seating spaces located in outdoor dining terraces in Group A-5 occupancies where the *means of egress* from the dining terraces to a *public way* are open to the outdoors.
6. An *accessible route* to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.
7. An *accessible route* to load and unload areas serving amusement rides.
8. An *accessible route* to play components or soft contained play structures.
9. An *accessible route* to team or player seating areas serving areas of sport activity.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent is to address vertical access within a floor, and between stories. The committee proposes to provide exceptions consistent with 2010 ADA, however, the decision was not to differentiate between public or private schools when dealing with dorm access.

Therefore, this proposal is to coordinate with ADA accessibility provisions that are less than currently in IBC or more specifically addressed than in IBC. Sections 1107.3 is intended to deal with connecting all accessible spaces within a building, with a reference to 1107.4 for changes in elevation of a story or to a mezzanine. Section 1107.4 addresses changes in elevation where typically the route is via an elevator and access on the site. There is a similar proposal for coordination between Sections 1104.3 and 1104.4.

Specific reasons for each revision are as follows:

- 1107.3 Accessible spaces –
  - New exception 1 is a reference to the 'elevator' exception between mezzanines and stories in Section 1107.4. (ADA 206.2.4 main text and Exp. 3)
  - Current exception 2, new Exception 3 – Coordination with ADA 404.2.4 Exception for maneuvering clearance at Group I-2 hospital doors is addressed in a separate proposal.
  - New exception 4 – relocated exception 2 from 1107.4 since this is an elevation change, not a story change
- 1107.4 Accessible routes –
  - Current exception 2 – relocated to 1107.3
  - New exception 2 – an accessible route is not required in jails where there are no Accessible units on upper levels. (ADA 206.2.3, Exp. 3)
  - New exception 3 – In large apartments, convents or monasteries, where Type A units are required, a route is not required to other stories in the building if all common use spaces are also on the accessible level. This is also consistent with FHA exception for Type B units. (ADA 206.2.2 Exp. 4)
  - New exception 4 – In sororities or fraternities, an accessible route is not required to other stories when the Accessible units and public and common spaces are on the accessible level. Dormitories in places of education, as Title II buildings, are required to have an accessible on all levels. (ADA 206.2.3 Exp. 4)
  - New exception 5 – Multi-story hotel rooms in hotels are not required to have an route between floors where a sleeping area and toilet are located on the accessible level (ADA 206.2.3 Exp. 5)
  - New exception 6 – In small sororities, fraternities and group homes, an accessible route is not required to a 2nd floor if Accessible and Type B units and all public and common spaces are on the accessible level.
  - New exception 7 – coordination with buildings without elevators and FHA Type B units in 1107.7.
- 1109.8 Lifts –
  - Item 4 – coordination with limits for platform lifts serving only individual units in ADA 206.7.3.

Cost Impact: None

E185-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.3-E-BALDASSARRA-CTC.docx

E186-12/13
1107.5.1.1, 1107.6.4.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1107.5.1 Group I-1. *Accessible units* and *Type B units* shall be provided in Group I-1 occupancies in accordance with Sections 1107.5.1.1 and 1107.5.1.2.

1107.5.1.1 Accessible units. In Group I-1, other than assisted living facilities, at least 4 percent, but not less than one, of the *dwelling units* and *sleeping unit*s shall be *Accessible units*. In Group I-1 assisted living facilities, at least 10 percent, but not less than one, of the *dwelling units* and *sleeping unit*s shall be *Accessible units.*

1107.5.1.2 Type B units. In structures with four or more *dwelling units* or *sleeping unit*s *intended to be occupied as a residence*, every *dwelling unit* and *sleeping unit intended to be occupied as a residence* shall be a *Type B unit*.
Exception: The number of *Type B units* is permitted to be reduced in accordance with Section 1107.7.

1107.6.4 Group R-4. *Accessible units* and *Type B units* shall be provided in Group R-4 occupancies in accordance with Sections 1107.6.4.1 and 1107.6.4.2.

1107.6.4.1 Accessible units. In Group R-4, other than assisted living facilities, at least one of the *dwelling* or *sleeping unit*s shall be an *Accessible unit*. In Group R-4 assisted living facilities, at least two of the *dwelling* or *sleeping unit*s shall be an *Accessible unit*.

1107.6.4.2 Type B units. In structures with four or more *dwelling units* or *sleeping unit*s *intended to be occupied as a residence*, every *dwelling unit* and *sleeping unit intended to be occupied as a residence* shall be a *Type B unit*.

Exception: The number of *Type B units* is permitted to be reduced in accordance with Section 1107.7.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent of this code change is to establish a minimum number of Accessible units required in Assisted Living Facilities for Group I-1 and R-4. The 10% Accessible units is based on anticipated need in these types of facilities.

The curre nt ADA requirements address residential facilities and long term care facilities, typically hospitals and nursing homes. The text does not directly address what the International Codes refer to as Assisted Living or Group I-1 facilities. The current text requires the following: 100% Accessible units in Group I-2 rehabilitation facilities; 50% Accessible units in Group I-2 nursing homes; 4% Accessible units in all Group I-1 and 2% Type A units in Group R-2 apartment buildings. The 2009 IBC had 10% Accessible units for residential board and care facilities, but the deletion of that term in the 2012 IBC resulted in the loss of that requirement. This addition will establish a minimum level for Group I-1 assisted living facilities while leaving other Group I-1 facilities to remain at 4%. Facilities can always choose to exceed this limit depending on the needs of their clientele and the desire of the facility to have optimum flexibility. Since these facilities are custodial care, and not nursing care, 10% Accessible units should meet demand.

The committee feels that if the building code addresses the minimum accessibility needs for these types of facilities, then the federal government may not feel that they need to establish additional accessibility requirements.

Cost Impact: Increase

E186-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.5.1-E-BALDASSARRA

E187-12
1107.5.5.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1107.5.5.1 Group I-3 sleeping units. In Group I-3 occupancies, at least ~~2~~ 3 percent of the total number of sleeping units in the facility, but not less than one unit in each classification level, ~~of the dwelling units and sleeping units~~ shall be Accessible units.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The purpose is to coordinate with DOJ regulations which have increased the requirement in 2010 ADA.

DOJ Regulations regarding jails includes the following:

DOJ Regulations 35.151 (k)(1) New construction of jails, prisons, and other detention and correctional facilities shall comply with the 2010 Standards except that public entities shall provide accessible mobility features complying with section 807.2 of the 2010 Standards for a minimum of 3%, but no fewer than one, of the total number of cells in a facility. Cells with mobility features shall be provided in each classification levels.(ADA 232.2.1)

Based on this information this proposal is asking for an increase in the percentage of Accessible units over the 2% specified in ADA Section 232.2.1. The term, ‘dwelling units’ is struck because there are no dwelling units within jails. The proposal does not specifically follow the language regarding dispersion because IBC Section 1107.5.5.2 and 1107.5.5.3 already have additional Accessible cells required for specialty cells and medical cells.

Cost Impact: None

E187-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.5.5.1-E-BALDASSARRA-CTC.docx

E188-12/13
1107.6.1.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1107.6.1.1 Accessible units. Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1. Where buildings contain more than 50 dwelling or sleeping units, the number of Accessible units shall be determined per building. Where buildings contain 50 or fewer dwelling or sleeping units, all dwelling units and sleeping units on a site shall be considered to determine the total number of Accessible units. Accessible units shall be dispersed among the various classes of units. ~~Roll-in showers provided in Accessible units shall include a permanently mounted folding shower seat.~~

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent of this proposal is to coordinate with the counting unit requirements within hotels with ADA (224.5) and the DOJ regulations. IBC addresses multiple buildings on a site making up the whole hotel. DOJ regulations address units in multiple buildings depending on the size of the buildings.

DOJ regulations are as follows:

36.406 (c) Places of lodging. Places of lodging subject to this part shall comply with the provisions of the 2010 Standards applicable to transient lodging, including, but not limited to, the requirements for transient lodging guest rooms in sections 224 and 806 of the 2010 Standards (pp. 82 and 210).

(1) Guest rooms. Guest rooms with mobility features in places of lodging subject to the transient lodging requirements of 2010 Standards shall be provided as follows—

(i) Facilities that are subject to the same permit application on a common site that each have 50 or fewer guest rooms may be combined for the purposes of determining the required number of accessible rooms and type of accessible bathing facility in accordance with table 224.2 to section 224.2 of the 2010 Standards (pp 83).

(ii) Facilities with more than 50 guest rooms shall be treated separately for the purposes of determining the required number of accessible rooms and type of accessible bathing facility in accordance with table 224.2 to section 224.2 of the 2010 Standards (p. 83).

The last sentence is no longer needed since ICC A117.1 requires all roll-in showers to have transfer seats.

Cost Impact: None

E188-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.6.1.1-E-BALDASSARRA-CTC.docx

E189-12/13
1107.6.1.1.1, E104.2, E104.2.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Delete without substitution:

~~**1107.6.1.1.1 Accessible unit facilities.** All interior and exterior spaces provided as part of or serving an Accessible dwelling unit or sleeping unit shall be accessible and be located on an accessible route.~~

~~**Exceptions:**~~

1. ~~Where multiple bathrooms are provided within an Accessible unit, at least one full bathroom shall be accessible.~~
2. ~~Where multiple family or assisted bathrooms serve an Accessible unit at least 50 percent but not less than one room for each use at each cluster shall be accessible.~~
3. ~~Five percent, but not less than one bed shall be accessible.~~

~~**E104.2 Accessible beds.** In rooms or spaces having more than 25 beds, 5 percent of the beds shall have a clear floor space complying with ICC A117.1.~~

~~**E104.2.1 Sleeping areas.** A clear floor space complying with ICC A117.1 shall be provided on both sides of the accessible bed. The clear floor space shall be positioned for parallel approach to the side of the bed.~~

~~**Exception:** This requirement shall not apply where a single clear floor space complying with ICC A117.1 positioned for parallel approach is provided between two beds.~~

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

These requirements are addressed in A117.1 in a more complete package and with better coordination with ADA.
IBC 1107.6.1.1.1 main text is already stated in IBC 1107.3.
Exception 1 is now addressed in ICC A117.1 1002.11. In a multi-bathroom unit, only one is required to be accessible.
Exception 2 is already addressed in IBC 1109.2 Exception 3.
Exception 3 would provide higher access in rooms with 25 beds or fewer, and the same for rooms with more than 25.
Appendix E104.2 and 104.2.1 can be deleted since addressed in ICC A117.1 Sections 1002.15.1 and 1002.15.2.

ADA reads as follows:

ADA 224.3 - DOJ Regulations 35.151 (e) 36.406 (d) Social service center establishments.
Group homes, halfway houses, shelters, or similar social service center ….
(1) In sleeping rooms with more than 25 beds covered by this section, a minimum of 5% of the beds shall have clear floor space complying with section 806.2.3 of the 2010 Standards.

Cost Impact: None

E189-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.6.1.1.1-E-BALDASSARRA-CTC.docx

E190 – 12
1107.6.2.1, 1107.6.2.1.1

Proponent: Karen L. Braitmayer, FAIA, Studio Pacifica, Ltd., representing self

Revise as follows:

1107.6.2 Group R-2. *Accessible units*, *Type A units* and *Type B units* shall be provided in Group R-2 occupancies in accordance with Sections 1107.6.2.1 and 1107.6.2.2.

1107.6.2.1 Apartment houses, <u>townhouses</u>, monasteries and convents. *Type A units* and *Type B units* shall be provided in apartment houses, <u>townhouses</u>, monasteries and convents in accordance with Sections 1107.6.2.1.1 and 1107.6.2.1.2.

1107.6.2.1.1 Type A units. In Group R-2 occupancies containing more than 20 *dwelling units* or *sleeping unit*s, at least 2 percent but not less than one of the units shall be a *Type A unit*. All Group R-2 units on a *site* shall be considered to determine the total number of units and the required number of *Type A units*. *Type A units* shall be dispersed among the various classes of units.

Exceptions:

1. The number of *Type A units* is permitted to be reduced in accordance with Section 1107.7.
2. *Existing structures* on a *site* shall not contribute to the total number of units on a *site*.
3. <u>Single story townhouses with the same amenities are permitted to be considered the same class as a multi-story unit for purposes of dispersion among the various classes of units.</u>

Reason: When the three legacy codes merged, some townhouse style units could be constructed under IRC or under IBC as a Group R-2 or R-3. The current text is not clear where these types of Group R-2 should fit within the requirements. They are similar to apartments and should be under 1107.6.2.1. ADA has technical guidance that a single story unit can be considered the same class of unit as a multi-story unit if it has the same size, number of bedrooms and bathrooms, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

E190-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.6.2.1-E-Braitmayer.doc

E191-12
1107.6.2.1.1, 1107.6.2.2, 1107.6.3, 1107.6.4, 1107.6.4.1, 1107.6.4.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1107.6.2 Group R-2. Accessible units, Type A units and Type B units shall be provided in Group R-2 occupancies in accordance with Sections 1107.6.2.1 and 1107.6.2.2.

1107.6.2.1 Apartment houses, monasteries and convents. Type A units and Type B units shall be provided in apartment houses, monasteries and convents in accordance with Sections 1107.6.2.1.1 and 1107.6.2.1.2.

1107.6.2.1.1 Type A units. In Group R-2 occupancies containing more than 20 dwelling units or sleeping units, at least 2 percent but not less than one of the units shall be a Type A unit. All Group R-2 units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units. <u>Bedrooms within monasteries and convents shall be counted as sleeping units for the purpose of determining the number of units.</u>

Exceptions:

1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.

1107.6.2.1.2 Type B units. Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.2.2 Group R-2 other than apartment houses, monasteries and convents. In Group R-2 occupancies, other than apartment houses, monasteries and convents, Accessible units and Type B units shall be provided in accordance with Sections 1107.6.2.2.1 and 1107.6.2.2.2. <u>Bedrooms within congregate living facilities shall be counted as sleeping units for the purpose of determining the number of units.</u>

1107.6.2.2.1 Accessible units. Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1.

1107.6.2.2.2 Type B units. Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and every sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.3 Group R-3. In Group R-3 occupancies where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit. <u>Bedrooms within congregate living facilities shall be counted as sleeping units for the purpose of determining the number of units.</u>

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.4 Group R-4. Accessible units and Type B units shall be provided in Group R-4 occupancies in accordance with Sections 1107.6.4.1 and 1107.6.4.2. Bedrooms within congregate living facilities shall be counted as sleeping units for the purpose of determining the number of units.

1107.6.4.1 Accessible units. At least one of the ~~dwelling or~~ sleeping units shall be an Accessible unit.

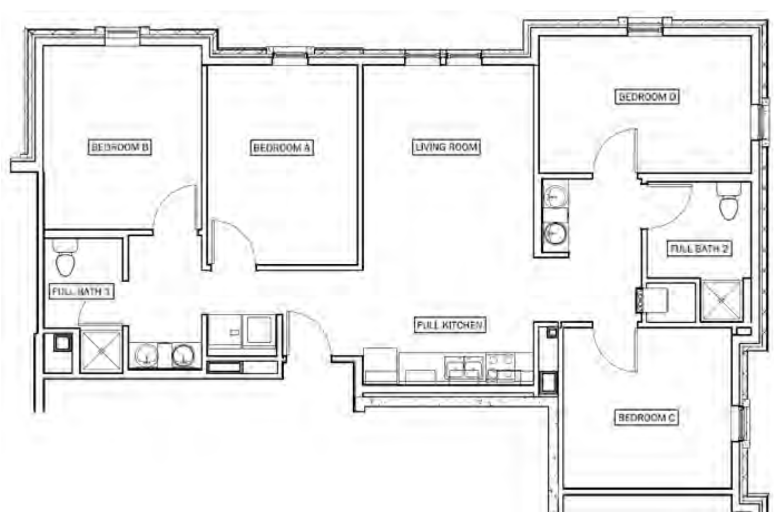
1107.6.4.2 Type B units. In structures with four or more ~~dwelling units or~~ sleeping units intended to be occupied as a residence, every ~~dwelling unit and~~ sleeping unit intended to be occupied as a residence shall be a Type B unit.

> **Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.
The intent is to try and address the new style of dormitory facilities that operate like dorms, but look like apartments. There has also been the interpretation that fraternities and sororities are a single dwelling unit for purposes of accessibility. The statement about congregate residences should help address how to count units for these types of facilities. This should be extended to the 16 or fewer congregate residences permitted in Group R-3 and R-4.

Group R-4 facilities are group homes and therefore are always congregate residences; therefore they will not include dwelling units.

Below is an example of student on-campus housing at Indiana University. While it looks like an apartment, it is handled administratively by the university exactly the same as typical dorm room assignments.



Cost Impact: None

E191-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.6.2-E-BALDASSARRA-CTC.docx

E192 – 12
1107.7.2

Proponent: Cheryl Kent, U.S. Department of Housing and Urban Development (cheryl.d.kent@hud.gov)

Revise as follows:

1107.7.2 Multistory units. A multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type B unit. Where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a Type B unit and a <u>kitchen and</u> toilet facility shall be provided on that floor.

Reason: At the time that HUD's Fair Housing Accessibility Guidelines were drafted, HUD included provisions for multistory units when such units may be located in a building with a public elevator, requiring that the story that is served by the building elevator be the primary entry to the unit, that this story comply with the accessibility requirements of the Fair Housing Act with respect to the rooms located on the entry/accessible floor, and that this floor include a complying bathroom or powder room. It was HUD's expectation that the main living areas, including the kitchen, living and dining rooms would be on this story/floor, but that this story may not always include an accessible bathroom or powder room, so the Guidelines specifically stated that it would. Since that time, there have been new building types introduced into the housing market, including a few situations where multistory units, located in a building with a public elevator, did not have the kitchen located on the story with the primary entry; or there were multiple floors, rather than the typical, 2-story unit with kitchen, living and dining on the main entry level and bedrooms and bathrooms above. As the Fair Housing Act requires usable kitchens and bathrooms, it has been our position that the kitchen also needs to be on the primary entry level of such multistory units. This code change proposal is intended to incorporate this requirement.

Cost Impact: There should be no significant cost impact because the typical building situation in which a multistory unit may be located in a building with public elevator service most often already does include the primary living areas and the kitchen on the primary entry level. In those few situations where this may not be the case, this changed code language will make it clear, from the outset, before design and construction, that the story of the unit that is served by the building elevator will be the primary entry to the unit, will have rooms on this level that comply with the accessibility requirements, including an accessible kitchen and bathroom or powder room; thus assuring that costs, if any, will be minimal.

E192-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.7.2-E-Kent.doc

E193 – 12
1107.7.2

Proponent: Karen L. Braitmayer, FAIA, Studio Pacifica, Ltd., representing self

Revise as follows:

1107.7.2 Multistory units. A *multistory dwelling* or *sleeping unit* which is not provided with elevator service is not required to be a Type A unit or a *Type B unit*. Where a *multistory unit* is provided with external elevator service to only one floor, for Type B units the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a *Type B unit* and a toilet facility shall be provided on that floor. Where a *multistory unit* is provided with external elevator service to only one floor, for Type A units the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a *Type A unit* and sleeping accommodations for two persons minimum, a kitchen, and a toilet and bathing facility shall be provided on that floor.

Reason: If a development requires Type A units the requirements should be consistent regardless if the buildings are IRC, Group R-2 or Group R-3. The original requirements for the Adaptable (now Type A units) were addressed for standard apartment buildings with single story units, not townhouses or apartments with multiple stories. This proposal would exempt Group R-2 townhouses without elevators from Type A and Type B requirements. Townhouses under IRC and Group R-3 are already exempted. Apartment buildings with two story apartments, would have to provide sleeping, cooking and bathing facilities on the main level of the unit, but would not be required to add a private elevator or platform lift within the unit. The requirements for what is on the ground floor is similar to what is required in the 2010 ADA for multi-story hotel rooms.

Cost Impact: The code change proposal will not increase the cost of construction.

E193-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.7.2-E-Braitmayer.doc

E194-12
1108.2.7.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1108.2.7.1 Receivers. <u>The number and type of</u> receivers shall be provided for assistive listening systems in accordance with Table 1108.2.7.1.

Exceptions:

1. Where a building contains more than one room or space used for assembly purposes, the total number of required receivers shall be permitted to be calculated according to the total number of seats in the building, provided that all receivers are usable with all systems and if the rooms or spaces used for assembly purposes required to provide assistive listening are under one management.
2. Where all seats in a building, room or space used for assembly purposes are served by an induction loop assistive listening system, the minimum number of receivers required by Table 1108.2.7.1 to be hearing-aid compatible shall not be required.

TABLE 1108.2.7.1
RECEIVERS FOR ASSISTIVE LISTENING SYSTEMS

CAPACITY OF SEATING IN ASSEMBLY AREAS	MINIMUM REQUIRED NUMBER OF RECEIVERS	MINIMUM NUMBER OF RECEIVERS TO BE HEARING-AID COMPATIBLE
50 or less	2	2
51 to 200	2, plus 1 per 25 seats over 50 seats*	2
201 to 500	2, plus 1 per 25 seats over 50 seats*	1 per 4 receivers*
501 to 1,000	20, plus 1 per 33 seats over 500 seats*	1 per 4 receivers*
1,001 to 2,000	35, plus 1 per 50 seats over 1,000 seats*	1 per 4 receivers*
Over 2,000	55, plus 1 per 100 seats over 2,000 seats*	1 per 4 receivers*

*Note: * = or fraction thereof

Reason: The requirements for hearing-aid compatible devices is currently in Table 1108.2.7.1, but it is not in the text.
The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E194-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1108.2.7.1-E-BALDASSARRA-CTC.docx

E195-12
1108.2.9, 1109.8

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1108.2.9 Dining and drinking areas. In dining and drinking areas, all interior and exterior floor areas shall be *accessible* and be on an accessible route.

Exceptions:

1. An *accessible route* between *accessible* leels and stories above or below is not required where permitted by Section 1104.4, Exception 1.
2. ~~In buildings or facilities not required to provide an *accessible route* between stories,~~ an *accessible route* to dining and drinking areas in a *mezzanine* is not required, provided that the *mezzanine* contains less than 25 percent of the total combined area for dining and drinking and the same services~~,~~ and decor ~~and amenities~~ are provided in the *accessible* area.
3. In sports facilities, tiered dining areas providing seating required to be *accessible* shall be required to have *accessible routes* serving at least 25 percent of the dining area, provided that *accessible routes* serve *accessible* seating and where each tier is provided with the same services.
4. Employee only work areas shall comply with Sections 1103.2.3 and 1104.3.1.

1109.8 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required *accessible route* in new construction where indicated in Items 1 through 10. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An *accessible route* to a performing area and speaker platforms ~~in Group A occupancies~~.

(No changes to items 2 through 10)

Reason: This proposal accomplishes a couple of things: First, Section 1108.2.9, is coordinates with the ADA by clarifying that the amount of area allowed not to be on an accessible route is a 25% of the total area, not potentially 25% of the area with an accessible route, and that the amount of area used for calculation is limited to areas for dining and drinking regardless of whether people sit or stand while drinking or dining. Remaining area of a restaurant that is not part of the drinking or dining area should not be used to determine the allowable area for drinking or dining that is not on an accessible route. Second, the proposed language focuses on the requirement for mezzanines rather than confusing it with requirements for stories and eliminates the unenforceable “amenities”. This term is not used in the ADA and should not be included in the IBC.

In Section 1109.8, performing areas and speaker platforms are not limited to Group A occupancies and the ADA does not limit it to assembly occupancies. This deletion is needed to coordinate with the ADA.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E195-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1108.2.9-E-BALDASSARRA-CTC.docx

E196-12
1108.4.3, 1108.4.3.1, 1108.4.3.2, 1109.11, E104.4

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1109.11 Seating at tables, counters and work surfaces. Where seating or standing space at fixed or built-in tables, counters or work surfaces is provided in accessible spaces, at least 5 percent of the seating and standing spaces, but not less than one, shall be accessible. ~~In Group I-3 occupancy visiting areas at least 5 percent, but not less than one, cubicle or counter shall be accessible on both the visitor and detainee sides.~~

Exception~~s~~:

~~1.~~ Check-writing surfaces at check-out aisles not required to comply with Section 1109.11.2 are not required to be accessible.

~~2. In Group I-3 occupancies, the counter or cubicle on the detainee side is not required to be accessible at noncontact visiting areas or in areas not serving accessible holding cells or sleeping units.~~

1109.11.1 Dispersion. Accessible fixed or built-in seating at tables, counters or work surfaces shall be distributed throughout the space or facility containing such elements and located on a level accessed by an accessible route.

~~1108.4.3~~ 1109.11.2 Visiting areas. Visiting areas in Judicial facilities in accordance with Section 1108.4 and Group I-3 shall comply with Sections ~~1108.4.3.1 and 1108.4.3.2~~ 1109.11.2.1 and 1109.11.2.2.

~~1108.4.3.1~~ 1109.11.2.1 Cubicles and counters. At least 5 percent, but ~~no fewer~~ not less than one of the cubicles, shall be accessible on both the visitor and detainee sides. Where counters are provided, at least one shall be accessible on both the visitor and detainee sides.

Exception: This requirement shall not apply to the detainee side of cubicles or counters at noncontact visiting areas not serving Accessible unit holding cells.

~~1108.4.3.2~~ 1109.11.2.2 Partitions. Where solid partitions or security glazing separate visitors from detainees, at least one of each type of cubicle or counter partition shall be accessible.

~~**E104.4 Partitions.** Solid partitions or security glazing that separates visitors from detainees in Group I-3 occupancies shall provide a method to facilitate voice communication. Such methods are permitted to include, but are not limited to, grilles, slats, talk-through baffles, intercoms or telephone handset devices. The method of communication shall be accessible to individuals who use wheelchairs and individuals who have difficulty bending or stooping. Hand-operable communication devices, if provided, shall comply with Section E106.3.~~

Reason: The current requirement for visiting cubicles, by being in Section1108.4.3, is literally only applicable to visiting areas in courthouses. The text is only partially repeated in Section 1109.11. For complete requirement in courthouses and jails, the requirements should be relocate to a general section and add requirements for glazed partitions. Section E104.4 should be deleted since it is redundant with Section 1109.11.2.2 and includes advisory language from ADA 232.5.2. This would be coordinated with ADA 213.4, 232.5 and 232.5.2.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E196-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1108.4.3-E-BALDASSARRA-CTC.docx

E197 – 12
1109.2, 1109.2.2

Proponent: Dominic Marinelli, representing Accessibility Services/United Spinal Association (dmarinelli@unitedspinal.org)

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections 1109.2.2 and 1109.2.3, at ~~At~~ least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

1. In toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, any of the following alternatives are allowed:
   - 1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
   - 1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
   - 1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
   - 1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.
6. Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

1109.2.2 Water closet compartment. Where water closet compartments are provided in a toilet room or bathing room, at least ~~one~~ five percent of the total number of compartments shall be wheelchair-accessible ~~compartment~~ compartments ~~shall be provided~~. Where the combined total water closet compartments and urinals provided in a toilet room or bathing room is six or more, at least ~~one~~ five percent of the total number of compartments shall be ambulatory-accessible water closet compartment shall be provided in addition to the wheelchair-accessible compartment.

1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one, shall be accessible. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges shall be provided.

Reason: Code change will provide proportionate accessibility in large toilet rooms necessary to accommodate the increasing number of people with ambulatory disabilities. People who walk with crutches, a cane, a walker, or who have limited balance generally find it easier and safer to use a stall that has parallel grab bars, hence the recommended increase to 5% scoping for ambulatory stalls. Additionally, The University of California, San Francisco Disability Statistics Center estimates that there are 6.1 million users of mobility devices, such as canes, crutches, and walkers and 1.7 million wheelchair or scooter riders. In the US in 2009, among the six types of disabilities identified in the American Community Survey, the highest prevalence rate amongst all age groups was for "Ambulatory Disability," 6.9 percent. (Source: 2009 Disability Status Report - United States | © 2011 Cornell

University). When you only examine the prevalence of ambulatory disabilities for people ages 65-74 (a portion of the population continuing to grow annually) the prevalence rate jumps to 16.5%. Given the fact that we are an aging society and more and more people require the use of either wheelchairs, crutches, canes or other devices –combined with the need for many people with disabilities to use parallel grab bars in stalls, we feel that this code change is necessary and serves the needs of our aging population.

Cost Impact: The code change will increase the cost of construction.

E197-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.2.2-E-Marinelli.doc

E198-12
1109.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

~~1.~~ ~~In~~ toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, ~~any of the following alternatives are allowed:~~ shall be permitted to comply with the specific exceptions in ICC A117.1.
- ~~1.1 Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;~~
- ~~1.2 The height requirements for the water closet in ICC A117.1 are not applicable;~~
- ~~1.3 Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and~~
- ~~1.4 The requirement for height, knee and toe clearance shall not apply to a lavatory.~~

2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be *accessible*.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be *accessible*.
6. Where toilet facilities are primarily for children's use, required *accessible* water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The intent of this proposal is to delete this allowance because it is a technical item addressed in ICC A117.1. This exception would be consistent with Title I modifications for employee work areas and the exemptions under 2010 ADA 203.9 and IBC 1103.2.3. Permitted by ADA/ABA as follows:

For text in ADA/ABA:
1.1. – 603.2.3 Exp.1
1.2. - 604.4 Exp 1
1.3. - 604.5 Exp 1
1.4. - 606.2 Exp 2

For text in ICC:
1.1 – 603.2.2 Exp. 1
1.2 - 604.4 Exp
1.3 - 604.5 Exp 1
1.4 – 606.2 Exp. 2

Cost Impact: None

E198-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.2-E-BALDASSARRA-CTC.docx

E199-12
1109.2

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be *accessible*. Where a floor level is not required to be connected by an *accessible route*, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each *accessible* toilet room and bathing room shall be *accessible*.

Exceptions:

1. In toilet rooms or bathing rooms accessed only through a private office, not for *common* or *public use* and intended for use by a single occupant, any of the following alternatives are allowed:
   1.1 Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
   1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
   1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
   1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve *dwelling units* or *sleeping units* that are not required to be *accessible* by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be *accessible*.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be *accessible*.
5. Toilet rooms <u>or bathing rooms</u> that are part of critical care or intensive care patient sleeping rooms <u>serving Accessible units</u> are not required to be *accessible*.
6. <u>Toilet rooms or bathing rooms that serve an Accessible sleeping unit designed for a bariatric patient are not required to comply with the toilet room and bathing room requirement in ICC A117.1</u>.
7. Where toilet facilities are primarily for children's use, required *accessible* water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

Reason: The intent of the new exception 6 is to address rooms specifically designed for bariatric patients. This issue is not addressed in new ADA requirements. The physical size of bariatric patients would not allow for water closets to be located with the center line 16" to 18" from the wall. In addition, if a nurse needs to get next to a patient to offer assistance in rising or sitting down, there is no space between the toilet and the wall. There is also a problem with the size of 36" x 36" for transfer showers. Designing for bariatric patients will result in toilet rooms and bathing rooms that are accessible for these patients, just not bathrooms that are accessible in accordance with ICC A117.1.

While Exception 2 would exempt the toilet rooms in the 90% of the hospital rooms not required to be accessible, the additional language in Exception 5 would reinforce that intent.

Providing the Accessible units in other areas of the hospital is no longer an option. The Department of Justice regulations state that the Accessible rooms must be distributed by type of medical specialty provided in the hospital.

> **DOJ regulations 35.151 (h) and 36.406 (g) Medical care facilities.** Medical care facilities that are subject to this section shall comply with the provisions of the 2010 Standards applicable to medical care facilities, including, but not limited to, sections 223 and 805. In addition, medical care facilities that do not specialize in the treatment of conditions that affect mobility shall disperse the accessible patient bedrooms required by section 223.2.1 of the 2010 Standards in a manner that is proportionate by type of medical specialty.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives.

The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

Cost Impact: None

E199-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.2-E-WILLIAMS-ADHOC.doc

E200-12/13
1109.2.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one, shall be accessible. <u>Where an accessible lavatory is located within the accessible water closet compartment that lavatory shall not be the only accessible lavatory in the multi-compartment toilet room.</u> Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges shall be provided.

Reason: Accessible lavatories must be available to all users of the toilet room any time the room is open. If the only accessible lavatory is within the accessible stall, others in the bathroom would not have access to that lavatory within the stall when the stall was in use. To prevent this, an additional accessible lavatory within the room should still be available for all users. It is not the intent of this section to prohibit someone from providing an accessible lavatory within an accessible stall, only that it not be the only one. This would be coordinated with ADA 213.3.4.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E200-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.2.3-E-BALDASSARRA-CTC.docx

E201 – 12
1109.5.1 (IPC [B] 410.2)

Proponent: Lee J. Kranz, City of Bellevue, Washington, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

Revise as follows:

1109.5.1 Minimum Number. No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheel-chair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain <u>with two separate spouts</u> that comply with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

IPC [B] 410.2 Minimum number. Where drinking fountains are required, not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exception: A single drinking fountain <u>with two separate spouts</u> that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.

Reason: The current language is not specific enough. It isn't clear that for the single drinking fountain, two separate spouts are required to meet the needs of the people in the wheelchairs and the standing people. The proposed verbiage clarifies this.

Cost Impact: The code change proposal will not increase the cost of construction.

E201-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.5.1-E-KRANZ

E202-12/13
1007.5 (IFC [B] 1007.5), 1109.8

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1109.8 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required *accessible route* in new construction where indicated in Items 1 through 10. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An *accessible route* to a performing area and speaker platforms in Group A occupancies.
2. An *accessible route* to *wheelchair spaces* required to comply with the *wheelchair space* dispersion requirements of Sections 1108.2.2 through 1108.2.6.
3. An *accessible route* to spaces that are not open to the general public with an *occupant load* of not more than five.
4. An *accessible route* within a *dwelling* or *sleeping unit* .

~~5. An *accessible route* to wheelchair seating spaces located in outdoor dining terraces in Group A-5 occupancies where the *means of egress* from the dining terraces to a *public way* are open to the outdoors~~

5 ~~6.~~ An *accessible route* to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.

6 ~~7.~~ An *accessible route* to load and unload areas serving amusement rides.

7 ~~8.~~ An *accessible route* to play components or soft contained play structures.

8 ~~9.~~ An *accessible route* to team or player seating areas serving areas of sport activity.

9 ~~10.~~ An *accessible route* where existing exterior *site* constraints make use of a ramp or elevator infeasible.

1007.5 (IFC [B] 1007.5) Platform lifts. Platform (wheelchair) lifts shall not serve as part of an *accessible means of egress*, except where allowed as part of a required *accessible route* in Section 1109.7, Items 1 through 8 ~~9~~. Standby power shall be provided in accordance with Chapter 27 for platform lifts permitted to serve as part of a *means of egress*.

Reason: Section 1108.2.9 allows at least 25% of a dining area to be on an accessible route regardless of whether it is interior or exterior. Exception #5 only allows a lift to be used for outdoor dining areas. Providing 25% of an outdoor dining area on an accessible route is no more challenging than providing 25% of an indoor dining area. This exception was first included in the code when there was no exception for tiered dining in a sports facility. It is no longer needed and should be deleted for greater coordination with the ADA. The change to Section 1007.5 is correlative only.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E202-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.8-E-BALDASSARRA-CTC.docx

E203 – 12
1109.10(New), E105.4

Proponent: Cheryl Kent, U.S. Department of Housing and Urban Development (cheryl.d.kent@hud.gov)

Add a new section:

1109.10 Mail receptacles. Where provided, mail receptacles shall be accessible in accordance with Sections 1109.10.1 or 1109.10.2.

1109.10.1 Dwelling units and sleeping units. Where mail receptacles are provided for Accessible, Type A or Type B dwelling and sleeping units, accessible mail receptacles shall be provided in accordance with 1109.10.1.1 or 1109.10.1.2.

1109.10.1.1 Centralized mail receptacles. Where each individual mail compartment of a centralized mail receptacle is assigned to a specific dwelling unit or sleeping unit, the individual mail compartments shall comply with 1109.10.1.1.1 or 1109.10.1.1.2.

1109.10.1.1.1 Buildings without an elevator. In a structure without an elevator, all individual mail compartments assigned to Accessible Units, Type A Units and Type B Units in each location shall be accessible.

1109.10.1.1.2 Buildings with an elevator. In a structure with an elevator, fifty percent of all individual mail compartments in each location shall be accessible. Individual mail compartments assigned to Accessible and Type A units shall be included in the accessible mailboxes. In addition to the individual mail compartments assigned to dwelling or sleeping units, an additional number of individual mail compartments that is equal to ten percent of the total number of dwelling units and sleeping units, but not less than one, at each location shall be accessible.

1109.10.1.1.3 Parcel lockers. All parcel lockers of centralized mail receptacles shall be accessible.

1109.10.1.2 Individual house-mounted and curbside mail receptacles. Where an individual house-mounted or curbside mail receptacle serves a dwelling unit or sleeping unit that is required to be an Accessible unit, Type A unit or Type B unit, the mail receptacle shall be accessible.

1109.10.2 Other occupancies. Where mail receptacles are provided in occupancies not falling within the purview of Section 1109.10.1, at least 5 percent, but not less than one, of each type in each location, shall be accessible.

(Renumber subsequent sections)

Delete without substitution:

~~**E105.4 Mailboxes.** Where mailboxes are provided in an interior location, at least 5 percent, but not less than one, of each type shall comply with ICC A117.1. In residential and institutional facilities, where mailboxes are provided for each dwelling unit or sleeping unit, mailboxes complying with ICC A117.1 shall be provided for each unit required to be an Accessible unit.~~

Reason: This proposed change is intended to specifically address accessibility requirements for mailboxes that are provided for buildings that are covered by the Fair Housing Act's (FHAct) accessible design and construction requirements and HUD's Fair Housing Accessibility Guidelines (HUD's Guidelines). Under the IBC, dwelling units and sleeping units that are covered by the FHAct and HUD's Guidelines are known as Type B Dwelling Units, so the focus of the proposal is on Type B Units; at the same time however, this proposal also will easily include Accessible Units and Type A units.

As background, it came to HUD's attention that Section E105.4 is being interpreted as applying to mailboxes serving Type B dwelling units. This was not HUD's understanding of the IBC, rather, we understood that Section 1107.3 covered mailboxes as well as all other types of public and common use facilities serving Type B dwelling units, and that absent specific scoping requirements to scope less than 100% of individual mailboxes, that all mailboxes were required to be accessible consistent with HUD's position in its Guidelines, which also does not scope less than 100% of mailboxes serving covered dwelling units. The above language will resolve this misunderstanding by striking the language in Appendix E and adding the new language outlined above.

HUD is also aware that HUD's position on mailboxes provided at FHAct covered buildings and current U.S. Postal Service regulations are not in harmony. HUD and U.S.P.S. held a number of discussions and meetings but are not in agreement on a resolution. Nevertheless, HUD recognizes that a 100% scoping requirement for mailboxes in hi-rise elevator buildings, coupled with situations where wall space may be limited, poses challenges for designers and builders in meeting the FHAct requirements as well as those in the IBC and ICC A117.1 for accessible reach ranges. Therefore, we recognize in this proposal that up to 50% of Type A or B units in a building with one or more elevators may not be served by an accessible mailbox. For this reason, this proposal relies on the provision of an additional number of unassigned mailboxes within the accessible reach range to be available, at the time of first occupancy, to serve persons with disabilities who may reside in these units and who may need an accessible mailbox.

Through this code change proposal, we are proposing a resolution that supports our on-going desire to promote consistency between the accessibility requirements in the FHAct and the IBC. In addition, HUD believes this proposal will resolve the conflict in a manner that is consistent with HUD's efforts to move toward more widely accepted accessible reach ranges that are in the more recent editions of the ICC A117.1 standard, as well as in recent government standards for the ADA. In this regard, although HUD's Guidelines use the 1986 edition of ICC A117.1, our proposal is in keeping with several of the more recent editions of IBC and ICC A117.1 that HUD has recognized as safe harbors for compliance under the FHAct, and which use the 48-inch maximum reach range for the high reach. Consequently, we are not recommending changes to the ICC A117.1 as part of this proposal, nor do we intend to do so.

We would like to ensure that architects and builders involved in designing and constructing buildings that are covered by the Fair Housing Act provide for accessibility of mailboxes consistent with HUD's regulations and Guidelines. Developers who deviate from these standards by providing mailboxes at higher reach ranges have been subject to enforcement proceedings brought by HUD as well as litigation brought by the Department of Justice. The Department of Justice has entered into a number of consent decrees which have required the developer to change the height of mailboxes serving covered multifamily dwellings. We believe this change is needed to ensure that the IBC is consistent with the Fair Housing Act and HUD's regulations and Guidelines, and to avoid unnecessary litigation with respect to mailboxes serving Type B dwelling units.

Cost Impact: There should be no significant cost impact since the IBC currently contains text at Section 1107.3 that would apply to mailboxes, like any other public and common use area, and again, absent scoping requirements, should have already been requiring 100% accessibility of mailboxes serving Type B dwelling units. However, by adding this new text to address mailboxes specifically, rather than just generally in Section 1107.3, the IBC will be assuring consistency with the Fair Housing Act, HUD's regulations and the Guidelines.

E203-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.16-E-Kent.doc

E204-12/13
1109.12.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1109.12.2 Check-out aisles. Where check-out aisles are provided, accessible check-out aisles shall be provided in accordance with Table 1109.12.2. Where check-out aisles serve different functions, ~~at least one accessible check-out aisle shall be provided for each function. Where checkout aisles serve different functions~~, accessible check-out aisles shall be provided in accordance with Table 1109.12.2 for each function. Where check-out aisles are dispersed throughout the building or facility, accessible check-out aisles shall also be dispersed. Traffic control devices, security devices and turnstiles located in accessible check-out aisles or lanes shall be accessible.

> **Exception:** Where the public use area is under 5000 square feet (465 m^2) no more than one accessible check-out aisle shall be required.

Reason: Two sentences are combined for clarity and coordination with ADA 227.2. The exception is permitted in ADA 227.2. This allowance seems reasonable for small spaces.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E204-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.12.2-E-BALDASSARRA-CTC.docx

E205-12/13

1109.13

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1109.13 Controls, operating mechanisms and hardware. Controls, operating mechanisms and hardware intended for operation by the occupant, including switches that control lighting and ventilation and electrical convenience outlets, in accessible spaces, along accessible routes or as parts of accessible elements shall be accessible.

1. through 6. *(No change)*
7. Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to ~~have operable parts of the release of latch on self-latching devices at 54 inches (1370 mm) maximum and 48 inches minimum above the finished floor or ground, provided the self-latching devices are not also self-locking devices, operated by means of a key, electronic opener, or integral combination lock.~~ comply with Section 1008.1.9.2.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

The purpose of this proposal is to delete redundant language in order to maintain consistent requirements over time between Section 1109.13 and 1008.1.9.2. This exception is in ADA/ABA 404.2.7 Doors and Gates Hardware, Exp. 2. The exception is allowed as a safety concern with children and pool access. IBC Section 1008.1.9.2 reads as follows:

1008.1.9.2 Hardware height. Door handles, pulls, latches, locks and other operating devices shall be installed 34 inches (864 mm) minimum and 48 inches (1219 mm) maximum above the finished floor. Locks used only for security purposes and not used for normal operation are permitted at any height.

> **Exception:** Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to have operable parts of the release of latch on self-latching devices at 54 inches (1370 mm) maximum above the finished floor or ground, provided the self-latching devices are not also self-locking devices operated by means of a key, electronic opener or integral combination lock.

Cost Impact: None

E205-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.13-E-BALDASSARRA-CTC.docx

E206-12
1109.13.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Delete without substitution:

~~**1109.13.1 Operable window.** Where operable windows are provided in rooms that are required to be accessible in accordance with Sections 1107.5.1.1, 1107.5.2.1, 1107.5.3.1, 1107.5.4, 1107.6.1.1, 1107.6.2.1.1, 1107.6.2.2.1 and 1107.6.4.1, at least one window in each room shall be accessible and each required operable window shall be accessible.~~

Reason: This list is a reference for Accessible units and Type A units. Windows within dwelling units and sleeping units are addressed in ICC A117.1, therefore they are not needed here. The ADA/ABA 229.1 has some requirements for operable windows, but has a series of exceptions, including one for residential uses.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E206-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.13.1-E-BALDASSARRA-CTC.docx

E207 – 12
1109.15 (New), E105.3

Proponent: Wesley Walters, Clark County Development Services, representing self (hww@clarkcountynv.gov)

Add new text as follows:

1109.15 Gaming machines and gaming tables. Where provided, two percent, but not less than one of each type of gaming tables provided shall be accessible and provided with a front approach. Where provided, two percent of gaming machines provided shall be accessible and provided with a front approach. Accessible gaming machines shall be distributed throughout the different types of gaming machines provided.

Revise as follows:

E105.3 Depositories, vending machines, change machines and similar equipment. Where provided, at least one of each type of depository, vending machine, change machine and similar equipment shall be accessible. Where provided, two percent of gaming machines provided shall be accessible and provided with a front approach. Accessible gaming machines shall be distributed throughout the different types of gaming machines provided.

Exception: Drive-up-only depositories are not required to comply with this section.

Reason: Gaming machines and tables are now found nation wide. All people need adequate access to these services/ games. Side approach access is not practical or comfortable for extended playing time. Front access allows integration with other players for equal play time and communication. When gaming tables are provide (i.e., black-jack, roulette, craps, poker), at least one of each type should be accessible. With gaming machines, there may be many different games and amounts within one facility. With so many options, distribution throughout the types should provide players with a variety of options. Gaming machines should be in the code and Appendix E since gaming tables can be mostly permanent, or just brought in like a vending machine.

Cost Impact: The code change proposal will not increase the cost of construction

E207-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1109.16 (NEW)-E-WALTERS

E208-12
1104.2, 1104.3, 1108.2.2.4, 1109.15, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows

SECTION 1110
RECREATIONAL FACILITIES

1110.1 ~~1109.15~~ General ~~Recreational and sports facilities.~~ Recreational ~~and sports~~ facilities shall be provided with accessible features in accordance with Sections 1110.2 ~~1109.15.1~~ through 1110.4 ~~1109.15.4~~.

1110.2 Facilities serving Group R-2, R-3 and R-4 occupancies. Recreational facilities that serve Group R-2, R-3 and Group R-4 shall comply with Section 1110.2.1 through 1110.2.3 as applicable.

1110.2.1 Facilities serving Accessible units. In Group R-2 and R-4 occupancies where recreational facilities serve Accessible units, every recreational facility of each type serving Accessible units shall be accessible.

1110.2.2 ~~1109.15.1~~ Facilities serving Type A and Type B units in a single building. In Group R-2, ~~and~~ R-3 and R-4 occupancies where recreational facilities ~~are provided serving~~ serve a single building containing Type A units or Type B units, 25 percent, but not less than one, of each type of recreational facility shall be accessible. Every recreational facility of each type on a site shall be considered to determine the total number of each type that is required to be accessible.

1110.2.3 ~~1109.15.2~~ Facilities serving Type A and Type B units in multiple buildings. In Group R-2, ~~and~~ R-3 and R-4 occupancies on a single site where multiple buildings containing Type A units or Type B units are served by recreational facilities, 25 percent, but not less than one, of each type of recreational facility serving each building shall be accessible. The total number of each type of recreational facility that is required to be accessible shall be determined by considering every recreational facility of each type serving each building on the site.

1110.3 ~~1109.15.3~~ Other occupancies. All recreational facilities not falling within the purview of Section 1110.2 ~~1109.15.1 or 1109.15.2~~ shall be accessible.

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.1 ~~1108.2.2.4~~ Team or player seating. At least one wheelchair space shall be provided in team or player seating areas serving areas of sport activity.

> **Exception:** Wheelchair spaces shall not be required in team or player seating areas serving bowling lanes that are not required to be ~~located on an~~ accessible ~~route~~ in accordance with Section ~~1109.15.4.1~~ 1110.4.2.

1110.4.2 ~~1109.15.4.1~~ Bowling lanes. An accessible route shall be provided to at least 5 percent, but no less than one, of each type of bowling lane.

1110.4.3 ~~1109.15.4.2~~ Court sports. In court sports, at least one accessible route shall directly connect both sides of the court.

1110.4.4 ~~**1109.15.4.3**~~ **Raised boxing or wrestling rings.** Raised boxing or wrestling rings are not required to be accessible or to be on an accessible route.

1110.4.5 ~~**1109.15.4.4**~~ **Raised refereeing, judging and scoring areas.** Raised structures used solely for refereeing, judging or scoring a sport are not required to be accessible or to be on an accessible route.

1110.4.6 ~~**1109.15.4.5**~~ **Raised diving boards and diving platforms.** Raised diving boards and diving platforms are not required to be accessible or to be on an accessible route.

1104.2 Within a site. At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

Exceptions:

1. An accessible route is not required between accessible buildings, accessible facilities, accessible elements and accessible spaces that have, as the only means of access between them, a vehicular way not providing for pedestrian access.
2. An accessible route to recreational facilities shall only be required to the extent specified in Section 1110.

1104.3 Connected spaces. When a building or portion of a building is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way.

Exceptions:

1. In assembly areas with fixed seating, an accessible route shall not be required to serve levels where wheelchair spaces are not provided.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.
3. An accessible route to recreational facilities shall only be required to the extent specified in Section 1110.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

The intent of this proposal is to move recreational scoping currently in the code to a separate section, Section 1110, Recreational Facilities, instead of being a part of Section 1109, Other Features and Facilities.

1104.2 & 1104.3 - The exceptions for accessible routes in Section 1104.2 and 1104.3 is correlative.

1110.2 through 1110.2.3 - When Group R-2 facilities, such as dormitory buildings, have Accessible units, all recreational facilities provided for residents in the dormitory must be accessible. This is consistent with 2010 ADA. When Group R-2 facilities (with Type A and Type B units), such as apartments and condominiums, have recreational facilities provided for residents, the requirement for 25% of each type is consistent with Fair Housing requirements.

1110.3 – Recreational facilities on their own, or associated with other occupancies are required to be accessible.

1110.4 through 11104.4.6 – the existing recreational provisions in the code are clarified for when they must be accessible, and when an accessible route is required. Please note that the allowances for diving boards is expanded in the proposal dealing with swimming pools.

The following is how this section would look if all proposals were approved. The order of the provisions from Section 1110.4.6 through 1110.4.14 is correlated with the order of the specific technical provisions found in ICC A117.1 and 2010 ADA.

Revise as follows

202 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

AREA OF SPORT ACTIVITY. That portion of an indoor or outdoor space, where the play or practice of a sport occurs.

1104.2 Within a site. At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

Exceptions:

1. An accessible route is not required between accessible buildings, accessible facilities, accessible elements and accessible spaces that have, as the only means of access between them, a vehicular way not providing for pedestrian access.
2. An accessible route to recreational facilities shall only be required to the extent specified in Section 1110

1104.3 Connected spaces. When a building or portion of a building is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way.

Exceptions:

1. In assembly areas with fixed seating, an accessible route shall not be required to serve levels where wheelchair spaces are not provided.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.
3. An accessible route to recreational facilities shall only be required to the extent specified in Section 1110.

1109.7 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required accessible route in new construction where indicated in Items 1 through ~~10~~ 11. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An accessible route to a performing area and speaker platforms in Group A occupancies.
2. An accessible route to wheelchair spaces required to comply with the wheelchair space dispersion requirements of Sections 1108.2.2 through 1108.2.6.
3. An accessible route to spaces that are not open to the general public with an occupant load of not more than five.
4. An accessible route within a dwelling or sleeping unit.
5. An accessible route to wheelchair seating spaces located in outdoor dining terraces in Group A-5 occupancies where the means of egress from the dining terraces to a public way are open to the outdoors.
6. An accessible route to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.
7. An accessible route to load and unload areas serving amusement rides.
8. An accessible route to play components or soft contained play structures.
9. An accessible route to team or player seating areas serving areas of sport activity.
10. An accessible route instead of gangways serving recreational boating facilities and fishing piers and platforms.
11. An accessible route where existing exterior site constraints make use of a ramp or elevator infeasible.

SECTION 1110
RECREATIONAL FACILITIES

1110.1 ~~1109.15~~ General ~~Recreational and sports facilities.~~ Recreational ~~and sports~~ facilities shall be provided with accessible features in accordance with Sections 1110.2 ~~1109.15.1~~ through 1110.4 ~~1109.15.4~~.

1110.2 Facilities serving Group R-2, R-3 and R-4 occupancies. Recreational facilities that serve Group R-2, R-3 and Group R-4 shall comply with Section 1110.2.1 through 1110.2.3 as applicable.

1110.2.1 Facilities serving Accessible units. In Group R-2 and R-4 occupancies where recreational facilities serve Accessible units, every recreational facility of each type serving Accessible units shall be accessible.

1110.2.2 ~~1109.15.1~~ Facilities serving Type A and Type B units in a single building. In Group R-2, ~~and~~ R-3 and R-4 occupancies where recreational facilities ~~are provided serving~~ serve a single building containing Type A units or Type B units, 25 percent, but not less than one, of each type of recreational facility shall be accessible. Every recreational facility of each type on a site shall be considered to determine the total number of each type that is required to be accessible.

1110.2.3 ~~1109.15.2~~ Facilities serving Type A and Type B units in multiple buildings. In Group R-2, ~~and~~ R-3 and R-4 occupancies on a single site where multiple buildings containing Type A units or Type B units are served by recreational facilities, 25 percent, but not less than one, of each type of recreational facility serving each building shall be accessible. The total number of each type of recreational facility that is required to be accessible shall be determined by considering every recreational facility of each type serving each building on the site.

1110.3 ~~1109.15.3~~ Other occupancies. All recreational facilities not falling within the purview of Section 1110.2 ~~1109.15.1 or 1109.15.2~~ shall be accessible ~~be accessible~~.

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.1 Areas of sports activity. Each area of sport activity shall be on an accessible route and shall not be required to be accessible except as provided for in Section 1110.4.2 through 1110.4.15.

1110.4.2 ~~1108.2.2.4~~ Team or player seating. At least one wheelchair space shall be provided in team or player seating areas serving areas of sport activity.

> **Exception:** Wheelchair spaces shall not be required in team or player seating areas serving bowling lanes that are not required to be ~~located on an~~ accessible ~~route~~ in accordance with Section ~~1109.15.4.1~~ 1110.4.3.

1110.4.3 ~~1109.15.4.1~~ Bowling lanes. An accessible route shall be provided to at least 5 percent, but no less than one, of each type of bowling lane.

1110.4.4 ~~1109.15.4.2~~ Court sports. In court sports, at least one accessible route shall directly connect both sides of the court.

1110.4.5 ~~1109.15.4.3~~ Raised boxing or wrestling rings. Raised boxing or wrestling rings are not required to be accessible or to be on an accessible route.

1110.4.6 ~~1109.15.4.4~~ Raised refereeing, judging and scoring areas. Raised structures used solely for refereeing, judging or scoring a sport are not required to be accessible or to be on an accessible route.

1110.4.7 Animal Containment Areas. Animal containment areas that are not within public use areas are not required to be accessible or to be on an accessible route.

1110.4.8 Amusement rides. Amusement rides that moves persons through a fixed course within a defined area shall comply with Section 1110.4.8.1 through 1110.4.8.3.

> **Exception:** Mobile or portable amusement rides shall not be required to be accessible.

1110.4.8.1 Load and unload areas. Load and unload areas serving amusement rides shall be accessible and be on an accessible route. Where load and unload areas have more than one loading or unloading position, at least one loading and unloading position shall be on an accessible route.

1110.4.8.1.1 Wheelchair spaces, ride seats designed for transfer, and transfer devices. Where amusement rides are in the load and unload position, the position serving a wheelchair spaces, amusement ride seats designed for transfer and transfer devices shall be on an accessible route.

1110.4.8.2 Minimum number. Amusement rides shall provide at least one wheelchair space, amusement ride seat designed for transfer, or transfer device.

> **Exceptions:**
>
> 1. Amusement rides that are controlled or operated by the rider are not required to comply with this section.
> 2. Amusement rides designed primarily for children, where children are assisted on and off the ride by an adult, are not required to comply with this section.
> 3. Amusement rides that do not provide seats that are built-in or mechanically fastened shall not be required to comply with this section.

1110.4.9 Recreational Boating Facilities. Boat slips required to be accessible by Section 1110.4.9.1 and 1110.4.9.2 and boarding piers at boat launch ramps required to be accessible by Section 1110.4.9.3 shall be on an accessible route.

1110.4.9.1 Boat Slips. Accessible boat slips shall be provided in accordance with Table 1110.4.9.1. All units on the site shall be combined to determine the number of accessible boat slips required. Where the number of boat slips is not identified, each 40 feet (12 m) of boat slip edge provided along the perimeter of the pier shall be counted as one boat slip for the purpose of this section.

> **Exception:** Boat slips not designed for embarking or disembarking are not required to be accessible or be on an accessible route.

TABLE 1110.4.9.1
BOAT SLIPS

Total Number of Boating Slips Provided	Minimum Number of Required Accessible Boating Slips
1 to 25	1
26 to 50	2
51 to 100	3
101 to 150	4
151 to 300	5
301 to 400	6
401 to 500	7
501 to 600	8
601 to 700	9
701 to 800	10
801 to 900	11
901 to 1000	12
1001 and over	12, plus 1 for every 100, or fraction thereof, over 1000

1110.4.9.2 Dispersion. Accessible boat slips shall be dispersed throughout the various types of boat slips provided. Where the minimum number of accessible boat slips has been met, no further dispersion shall be required.

1110.4.9.3 Boarding Piers at Boat Launch Ramps. Where boarding piers are provided at boat launch ramps, at least 5 percent, but no fewer than one, of the boarding piers shall be accessible.

1110.4.10 Exercise Machines and Equipment. At least one of each type of exercise machine and equipment shall be on an accessible route.

1110.4.11 Fishing Piers and Platforms. Fishing piers and platforms shall be accessible and be on an accessible route.

1110.4.12 Miniature golf facilities. Miniature golf facilities shall comply with 1110.4.12.1 through 1110.4.12.3.

1110.4.12.1 Minimum Number. At least 50 percent of holes on miniature golf courses shall be accessible.

1110.4.12.2 Miniature Golf Course Configuration. Miniature golf courses shall be configured so that the accessible holes are consecutive. Miniature golf courses shall provide an accessible route from the last accessible hole to the course entrance or exit without requiring travel through any other holes on the course.
Exception: One break in the sequence of consecutive holes shall be permitted provided that the last hole on the miniature golf course is the last hole in the sequence.

1110.4.12.3 Accessible route. Holes required to comply with 1110.4.11.1, including the start of play, shall be on an accessible route.

1110.4.13 Play Areas. Play areas containing play components designed and constructed for children shall be accessible and be located on an accessible route.

1110.4.14 Swimming pools, wading pools, hot tubs and spas. Swimming pools, wading pools, hot tubs and spas shall be accessible and be on an accessible route.

Exceptions:

1. Pools or a designated section of a pool used as a terminus for a water slide flume shall not be required to provide an accessible means of entry, provided that a portion of the catch pool edge is on an accessible route.
2. Where spas or hot tubs are provided in a cluster, at least 5 percent, but no less than one spa or hot tub in each cluster, shall be accessible and be on an accessible route.

1110.4.14.1 ~~1109.15.4.5~~ Raised diving boards and diving platforms. Raised diving boards and diving platforms are not required to be accessible or to be on an accessible route.

1110.4.14.2 Water Slides. Water slides are not be required to be accessible or to be on an accessible route.

1110.4.15 Shooting Facilities with Firing Positions. Where shooting facilities with firing positions are designed and constructed at a site, at least 5 percent, but no less than one, of each type of firing position shall be accessible and be on an accessible route.

~~1110.3~~ 1111.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown.

1. Each assembly area required to comply with Section 1108.2.7 shall provide a sign notifying patrons of the availability of assistive listening systems.

Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems .

2. At each door to an area of refuge, an exterior area for assisted rescue, an egress stairway, exit passageway and exit discharge, signage shall be provided in accordance with Section 1011.4.
3. At areas of refuge, signage shall be provided in accordance with Section 1007.11.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section 1007.11.
5. At two-way communication systems, signage shall be provided in accordance with Section 1007.8.2.
6. Within interior exit stairways and ramps, signage shall be provided in accordance with Section 1022.9.
7. Signs identifying the type of access provided on amusement rides required to be accessible by Section 1110 shall be provided at entries to queues and waiting lines. In addition, where accessible unload areas also serve as accessible load areas, signs indicating the location of the accessible load and unload areas shall be provided at entries to queues and waiting lines. These directional sign characters shall meet the visual character requirements in accordance with ICC A117.1

3411.8 (IEBC [B] 410.8) Scoping for alterations. The provisions of Sections 3411.8.1 through ~~3411.8.14~~ 3411.8.15 shall apply to alterations to existing buildings and facilities.

3411.8.15 (IEBC [B] 410.8.15) Amusement rides. Where the structural or operational characteristics of an amusement ride are altered to the extent that the amusement ride's performance differs from that specified by the manufacturer or the original design, the amusement ride shall comply with requirements for new construction in Section 1110.4.8.

APPENDIX E
SUPPLEMENTARY ACCESSIBILITY REQUIREMENTS

SECTION E106
RECREATIONAL FACILITIES

E106.1 Golf Facilities. Golf facilities shall comply with E106.1.1 through E106.1.4.

E106.1.1 Golf Courses. Golf courses shall comply with E106.1.1.1 through E106.1.1.3.

E106.1.1.1 Teeing Grounds. Where one teeing ground is provided for a hole, the teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where two teeing grounds are provided for a hole, the forward teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where three or more teeing grounds are provided for a hole, at least two teeing grounds, including the forward teeing ground, shall be designed and constructed so that a golf car can enter and exit each teeing ground.

E106.1.1.2 Putting Greens. Putting greens shall be designed and constructed so that a golf car can enter and exit the putting green.

E106.1.1.3 Weather Shelters. Where provided, weather shelters shall be designed and constructed so that a golf car can enter and exit the weather shelter and shall be accessible.

E106.1.2 Practice Putting Greens, Practice Teeing Grounds, and Teeing Stations at Driving Ranges. At least 5 percent, but no fewer than one, of practice putting greens, practice teeing grounds, and teeing stations at driving ranges shall be designed and constructed so that a golf car can enter and exit.

E106.1.3 Accessible route. At least one accessible route shall connect accessible elements and spaces within the boundary of the golf course. In addition, accessible routes serving golf car rental areas; bag drop areas; course weather shelters complying with Section E106.1.1.3; course toilet rooms; practice putting greens; practice teeing grounds; and teeing stations at driving ranges complying with Section E106.1.2 shall comply with the accessible route requirements for golf courses in ICC A117.1.
Exception: Accessible golf car passages shall be permitted to be used for all or part of accessible routes required by this section.

E106.1.4 Teeing Grounds. When teeing grounds are being altered, teeing grounds shall comply with, Section E106.1.1.1.
Exception: In existing golf courses, the forward teeing ground shall not be required to be one of the teeing grounds on a hole designed and constructed so that a golf car can enter and exit the teeing ground where compliance is not feasible due to terrain.

Part II

Revise as follows:

IEBC 705.1 General. A *facility* that is altered shall comply with the applicable provisions in Sections 705.1.1 through ~~705.1.14~~ 705.1.15, and Chapter 11 of the *International Building Code* unless it is *technically infeasibl*e. Where compliance with this section is *technically infeasible*, the alteration shall provide access to the maximum extent that is technically feasible. A *facility* that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 705.2.
2. Accessible means of egress required by Chapter 10 of the *International Building Code* are not required to be provided in existing *facilities*.
3. Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing *facilities* undergoing less than a Level 3 *alteration*.
4. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units.

IEBC 705.1.15 Amusement rides. Where the structural or operational characteristics of an amusement ride are altered to the extent that the amusement ride's performance differs from that specified by the manufacturer or the original design, the amusement ride shall comply with requirements for new construction in the International Building Code, Section 1110.4.8.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E208-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.2-E-BALDASSARRA-CTC.docx

E209-12

202, 1109.15.4, 1110(New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.1 Areas of sports activity. Each area of sport activity shall be on an accessible route and shall not be required to be accessible except as provided for in Sections 1110.4.2 through 1110.4.15.

Add new definition as follows:

SECTION 202
DEFINITIONS

AREA OF SPORT ACTIVITY. That portion of an indoor or outdoor space, where the play or practice of a sport occurs.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

The definition for 'area of sport activity' is correlated with 2010 ADA. Technical guidance provided by the Access Board indicates that "area of sports activity" is a broad term intended to cover a diverse number of indoor and outdoor sports fields and areas. The "area of sports activity" is "that portion of a room or space where the play or practice of a sport occurs." In addition, a safety border is provided around the field. Players may temporarily be in the space between the boundary lines and the safety border when they are pushed out of bounds or momentum carries them forward when receiving a pass. As in football, that space is used as part of the game and is included in the area of sports activity.

The intent is that an accessible route is required to each location where a sports activity takes place, such as to the baseball field, ice rink, tennis court or swimming pool. It is not intended for there to be accessibility requirements into or onto the playing surface unless specifically addressed. For example, an accessible route is required to the baseball field or ice rink, but participation on the field is based on the individual's ability. The baseball field or ice rink itself is not required to be modified. Areas such as tennis courts have to have a route to each side of the court, because playing tennis includes changing sides between sets (this requirement is in current language). Swimming pools are also areas of sports activities. The new provisions in ICC A117.1 will address how to provide access into the water based on the type of pool and options for entry. (There is a companion proposal to provide additional guidance for pools.)

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E209-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-E-AREA OF SPORTS ACTIVITY-BALDASSARRA-CTC.docx

E210-12
1109.15.4, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~**1109.15.4**~~ **Recreational** ~~**and sports**~~ **facilities** ~~**exceptions.**~~ Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.7 Animal Containment Areas. Animal containment areas that are not within public use areas are not required to be accessible or to be on an accessible route.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

Technical guidance provided by the Access Board indicates that "If the public has access to animal containment areas, accessible routes must connect to each animal containment areas. Examples may include petting zoos, petting farms, public pathways for viewing livestock display tents, or other area where public has access to animals. Horse riding arenas would be considered 'areas of sports activity'. Animal containment areas not open to the public are exempt.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E210-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#1-E-BALDASSARRA-CTC.docx

E211-12

1109.15.4, 1110 (New), 1110.3, 3411.8.15 (New) [IEBC [B] 410.8.15 (New)]

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~**1109.15.4**~~ **Recreational** ~~**and sports**~~ **facilities** ~~**exceptions.**~~ Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.8 Amusement rides. Amusement rides that moves persons through a fixed course within a defined area shall comply with Section 1110.4.8.1 through 1110.4.8.3.

Exception: Mobile or portable amusement rides shall not be required to be accessible.

1110.4.8.1 Load and unload areas. Load and unload areas serving amusement rides shall be accessible and be on an accessible route. Where load and unload areas have more than one loading or unloading position, at least one loading and unloading position shall be on an accessible route.

1110.4.8.1.1 Wheelchair spaces, ride seats designed for transfer, and transfer devices. Where amusement rides are in the load and unload position, the position serving a wheelchair spaces, amusement ride seats designed for transfer and transfer devices shall be on an accessible route.

1110.4.8.2 Minimum number. Amusement rides shall provide at least one wheelchair space, amusement ride seat designed for transfer, or transfer device.

Exceptions:

1. Amusement rides that are controlled or operated by the rider are not required to comply with this section.
2. Amusement rides designed primarily for children, where children are assisted on and off the ride by an adult, are not required to comply with this section.
3. Amusement rides that do not provide seats that are built-in or mechanically fastened shall not be required to comply with this section.

1111.3 ~~**1110.3**~~ **Other signs.** Signage indicating special accessibility provisions shall be provided as shown.

1. Each assembly area required to comply with Section 1108.2.7 shall provide a sign notifying patrons of the availability of assistive listening systems.

   Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems .

2. At each door to an *area of refuge*, an exterior area for assisted rescue, an egress *stairway*, *exit passageway* and *exit discharge*, signage shall be provided in accordance with Section 1011.4.
3. At *areas of refuge*, signage shall be provided in accordance with Section 1007.11.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section 1007.11.

5. At two-way communication systems, signage shall be provided in accordance with Section 1007.8.2.
6. Within interior exit stairways and ramps, signage shall be provided in accordance with Section 1022.9.
7. Signs identifying the type of access provided on *amusement rides* required to be accessible by Section 1110 shall be provided at entries to queues and waiting lines. In addition, where *accessible* unload areas also serve as *accessible* load areas, signs indicating the location of the *accessible* load and unload areas shall be provided at entries to queues and waiting lines. These directional sign characters shall meet the visual character requirements in accordance with ICC A117.1

3411.8 (IEBC [B] 410.8) Scoping for alterations. The provisions of Sections 3411.8.1 through ~~3411.8.14~~ 3411.8.15 shall apply to *alterations* to existing buildings and facilities.

3411.8.15 (IEBC [B] 410.8.15) Amusement rides. Where the structural or operational characteristics of an amusement ride are altered to the extent that the amusement ride's performance differs from that specified by the manufacturer or the original design, the amusement ride shall comply with requirements for new construction in Section 1110.4.8.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for amusement rides. To the extent that amusement rides are subject to the code, they should be accessible and usable by individuals with disabilities. These scoping provisions are flexible permitting latitude in terms of the method of access e.g. transfer seat, roll-on seat or transfer device to lift the rider. Mobile and portable rides are exempted in Section 1110.4.8. Rides without seats, those designed for children who are assisted onto the ride and those rides controlled by the user are also exempted under 1110.4.8.2 from providing wheelchair transfer spaces. Technical criteria can be found in the 2009 edition of the ICC A117.1, Section 1102 and includes accessible routes, load and unload areas, wheelchair spaces on rides, seats for transfer, and transfer devices.

There is a correlative change to IEBC for existing amusement rides.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E211-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#2-E-BALDASSARRA-CTC.docx

E212-12
1109.7, 1109.15.4, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.9 Recreational Boating Facilities. Boat slips required to be accessible by Section 1110.4.9.1 and 1110.4.9.2 and boarding piers at boat launch ramps required to be accessible by Section 1110.4.9.3 shall be on an accessible route.

1110.4.9.1 Boat Slips. Accessible boat slips shall be provided in accordance with Table 1110.4.9.1. All units on the site shall be combined to determine the number of accessible boat slips required. Where the number of boat slips is not identified, each 40 feet (12 m) of boat slip edge provided along the perimeter of the pier shall be counted as one boat slip for the purpose of this section.

> **Exception:** Boat slips not designed for embarking or disembarking are not required to be accessible or be on an accessible route.

TABLE 1110.4.9.1
BOAT SLIPS

Total Number of Boating Slips Provided	Minimum Number of Required Accessible Boating Slips
1 to 25	1
26 to 50	2
51 to 100	3
101 to 150	4
151 to 300	5
301 to 400	6
401 to 500	7
501 to 600	8
601 to 700	9
701 to 800	10
801 to 900	11
901 to 1000	12
1001 and over	12, plus 1 for every 100, or fraction thereof, over 1000

1110.4.9.2 Dispersion. Accessible boat slips shall be dispersed throughout the various types of boat slips provided. Where the minimum number of accessible boat slips has been met, no further dispersion shall be required.

1110.4.9.3 Boarding Piers at Boat Launch Ramps. Where boarding piers are provided at boat launch ramps, at least 5 percent, but no fewer than one, of the boarding piers shall be accessible.

1110.4.11 Fishing Piers and Platforms. Fishing piers and platforms shall be accessible and be on an accessible route.

1109.7 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required accessible route in new construction where indicated in Items 1 through ~~10~~ 11. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An accessible route to a performing area and speaker platforms in Group A occupancies.
2. An accessible route to wheelchair spaces required to comply with the wheelchair space dispersion requirements of Sections 1108.2.2 through 1108.2.6.
3. An accessible route to spaces that are not open to the general public with an occupant load of not more than five.
4. An accessible route within a dwelling or sleeping unit.
5. An accessible route to wheelchair seating spaces located in outdoor dining terraces in Group A-5 occupancies where the means of egress from the dining terraces to a public way are open to the outdoors.
6. An accessible route to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.
7. An accessible route to load and unload areas serving amusement rides.
8. An accessible route to play components or soft contained play structures.
9. An accessible route to team or player seating areas serving areas of sport activity.
10. An accessible route instead of gangways serving recreational boating facilities and fishing piers and platforms.
11. An accessible route where existing exterior site constraints make use of a ramp or elevator infeasible.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for boating and fishing piers. It is common for boating and fishing piers to be constructed as part of waterfront development that is subject to the building code. Technical criteria can be found in the 2009 edition of the ICC A117.1, Sections 1103 and 1105 and includes accessible routes and clearances for boat docks and accessible routes, railings, edge protection, clear floor space and turning space for fishing piers. If a guard is provided or required, it is not required to be lowered for fishermen with disabilities.

Section 1110.4.9.3 does not require accessibility to the boat launch ramp, but only where a boarding pier is provided adjacent to the boat launch ramp.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E212-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#3-E-BALDASSARRA-CTC.doc

E213-12
1109.15.4, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 **~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~.** Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.10 Exercise Machines and Equipment. At least one of each type of exercise machine and equipment shall be on an accessible route.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for areas that contain exercise machines and equipment. A preliminary layout is typically supplied as part of the construction drawings, similar to table layouts for restaurants. The technical criteria do not require the equipment and machines to be accessible; they merely require clearances adjacent to the machines so that individuals with a mobility impairment can get to them. Technical criteria for the clear floor space can be found in the 2009 edition of the ICC A117.1, Section 1104.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E213-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#7-E-BALDASSARRA-CTC.docx

E214-12
1109.15.4, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.12 Miniature golf facilities. Miniature golf facilities shall comply with Section 1110.4.12.1 through 1110.4.12.3.

1110.4.12.1 Minimum Number. At least 50 percent of holes on miniature golf courses shall be accessible.

1110.4.12.2 Miniature Golf Course Configuration. Miniature golf courses shall be configured so that the accessible holes are consecutive. Miniature golf courses shall provide an accessible route from the last accessible hole to the course entrance or exit without requiring travel through any other holes on the course.

> **Exception:** One break in the sequence of consecutive holes shall be permitted provided that the last hole on the miniature golf course is the last hole in the sequence.

1110.4.12.3 Accessible route. Holes required to comply with Section 1110.4.12.1, including the start of play, shall be on an accessible route.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for miniature golf facilities. Today, miniature golf facilities are likely to be structures comprised of components and materials that are subject to the IBC. To the extent that such facilities are subject to the IBC, they should be accessible to individuals with mobility impairments. Technical criteria can be found in the 2009 edition of the ICC A117.1, Section 1107 and includes accessible routes and criteria for each hole.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E214-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#6-E-BALDASSARRA-CTC.docx

E215-12
1109.15.4, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.13 Play Areas. Play areas containing play components designed and constructed for children shall be accessible and be located on an accessible route.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for play areas. Currently, Section 402.6.3 addresses "structures intended as children's playgrounds" and Section 105.2 exempts "swings and other playground equipment accessory to detached one- and two-family dwellings" from permits. To the extent that children's play facilities are covered by the IBC, they should be accessible to children with disabilities. These scoping requirements are reasonable and are the result of recommendations from a regulatory negotiation committee the Access Board established for this purpose that included ASTM Public Playground, Soft Contained Play, and Playground Surfacing Systems Committees manufacturers of play equipment, landscape architects, government associations, elementary school associations, and organizations representing people with disabilities. Since the Access Board's guidelines were published in late 2000, manufacturers offer play equipment complying with these scoping and technical criteria. The 2009 edition of the ICC A117.1, Section 1108, contains technical criteria for play areas consistent with the 2010 ADA Standard.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E215-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#4-E-BALDASSARRA-CTC.doc

E216-12
1109.15.4, 1109.15.4.5, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities shall be ~~required to be~~ accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.14 Swimming pools, wading pools, hot tubs and spas. Swimming pools, wading pools, hot tubs and spas shall be accessible and be on an accessible route.

Exceptions:

1. *Catch Pools or a designated section of a pool used as a terminus for a water slide flume* shall not be required to provide an *accessible* means of entry, provided that a portion of the *catch pool* edge is on an *accessible* route.
2. Where spas or hot tubs are provided in a cluster, at least 5 percent, but no less than one spa or hot tub in each cluster, shall be accessible and be on an accessible route.

1110.4.14.1 ~~1109.15.4.5~~ Raised diving boards and diving platforms. Raised diving boards and diving platforms are not required to be accessible or to be on an accessible route.

1110.4.14.2 Water Slides. Water slides are not be required to be accessible or to be on an accessible route.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for swimming pools, wading pools, hot tubs and spas. This is especially important that use swimming pools for exercise or rehabilitation. The exceptions for Section 1110.4.14 are exceptions for pools used only be water slides, and a percentage of hot tubs. These exceptions, along with the exceptions for diving boards and water slides are logical, and consistent with ADA. The 2009 edition of the ICC A117.1, Section 1109, contains technical criteria for play areas consistent with the 2010 ADA Standard. Criteria for entry points include options for pool lifts, sloped entries, transfer walls, transfer systems and pool stairs.

The *International Swimming Pool and Spa Code*, Section 307.9, references the IBC for accessibility requirements for pools.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E216-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#5-E-BALDASSARRA-CTC.docx

E217-12
1109.15.4, 1110 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 1110
RECREATIONAL FACILITIES

1110.4 ~~1109.15.4~~ Recreational ~~and sports~~ facilities ~~exceptions~~. Recreational ~~and sports~~ facilities ~~required to be~~ shall be accessible ~~shall be exempt from this chapter to~~ and shall be on an accessible route to the extent specified in this section.

1110.4.15 Shooting Facilities with Firing Positions. Where shooting facilities with firing positions are designed and constructed at a site, at least 5 percent, but no fewer than one, of each type of firing position shall be accessible and be on an accessible route.

Reason: This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for shooting facilities where fixed firing positions are provided. Technical criteria can be found in the 2009 edition of the ICC A117.1, Section 1110. Technical criteria for a turning space at the firing position can be found in the 2009 edition of the ICC A117.1, Section 1106.

By types of firing positions, the intent is to address types of weapons, rifle, handgun, bow and arrow; lighted; and covered or not covered.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E217-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110#8-E-BALDASSARRA-CTC.docx

E218-12
1110.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1110.1 Signs. Required accessible elements shall be identified by the International Symbol of Accessibility at the following locations:

1. Accessible parking spaces required by Section 1106.1 except where the total number of parking spaces provided is four or less.
2. In Group I-1, R-2 and R-3 facilities, where parking *spaces* are assigned to specific *dwelling units* or *sleeping units*, identification of *accessible* parking *spaces* shall not be required.

~~2~~3. Accessible passenger loading zones.
~~3~~4. Accessible rooms where multiple single-user toilet or bathing rooms are clustered at a single location.
~~4~~5. Accessible entrances where not all entrances are accessible.
~~5~~6. Accessible check-out aisles where not all aisles are accessible. The sign, where provided, shall be above the check-out aisle in the same location as the checkout aisle number or type of check-out identification.
~~6~~7. Family or assisted-use toilet and bathing rooms.
~~7~~8. Accessible dressing, fitting and locker rooms where not all such rooms are accessible.
~~8~~9. Accessible areas of refuge in accordance with Section 1007.9.
~~9~~10. Exterior areas for assisted rescue in accordance with Section 1007.9.

Reason: This proposal will coordinate with ADA 216.5 Exception 2. While accessible parking spaces would still be required to be provided within the lot, those spaces would not have to be signed when parking was assigned to specific dwelling units or sleeping units.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E218-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.1-E-BALDASSARRA-CTC.docx

E219 – 12
1110.1

Proponent: Jerome Seville, Commonwealth of Pennsylvania representing self

Revise as follows:

1110.1 Signs. Required *accessible* elements shall be identified by the International Symbol of Accessibility at the following locations:

1. *Accessible* parking spaces required by Section 1106.1 except where the total number of parking spaces provided is four or less.
2. *Accessible* passenger loading zones.
3. *Accessible* rooms where multiple single-user toilet or bathing rooms are clustered at a single location.
4. *Accessible* entrances where not all entrances are accessible.
5. *Accessible* check-out aisles where not all aisles are accessible. The sign, where provided, shall be above the check-out aisle in the same location as the checkout aisle number or type of check-out identification.
6. Family or assisted-use toilet and bathing rooms.
7. *Accessible* dressing, fitting and locker rooms where not all such rooms are *accessible*.
8. *Accessible areas of refuge* in accordance with Section 1007.9.
9. Exterior areas for assisted rescue in accordance with Section 1007.9.
10. In recreational facilities, lockers that are required to be accessible in accordance with Section 1109.9.

Reason: To readily identify accessible lockers to those individuals who need them when the lockers occur in a public setting. e.g. Locker room of a public golf course or swimming pool.

Cost Impact: Minimal. Just the cost of signs.

E219-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.1-E-Seville.doc

E220 – 12
1110.2

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

1110.2 Directional <u>and informational</u> signage. ~~Directional signage indicating the route to the nearest like *accessible* element shall be provided at the following locations.~~ <u>Signage indicating directional information, information about functional spaces or signage indicating special accessibility provisions shall be provided at the following locations.</u> These directional signs shall include the International Symbol of Accessibility

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an *accessible route*.
4. At each separate-sex toilet and bathing room indicating the location of the nearest family or assisted-use toilet or bathing room where provided in accordance with Section 1109.2.1.
5. At *exits* and *exit stairways* serving a required *accessible* space, but not providing an *approved accessible means of egress*, signage shall be provided in accordance with Section 1007.10.

Reason: As written, IBC 1110.3 addresses specific signage for special accessibility provisions. There are situations where functional information is required, but is not addressed by the code. The intent is to broaden this code section so as to address not only the location of accessible counters, communications (computer/telephone), etc. but address unique building functions such as a cafeteria, performing arts center, gymnasium, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

E220-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.2-E-Dahmen.doc

E221-12
1110.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1110.2 Directional signage. Directional signage indicating the route to the nearest like accessible element shall be provided at the following locations. These directional signs shall include the International Symbol of Accessibility and <u>sign characters shall meet the visual character requirements in accordance with ICC A117.1:</u>

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an *accessible route*.
4. At each separate-sex toilet and bathing room indicating the location of the nearest family or assisted-use toilet or bathing room where provided in accordance with Section 1109.2.1.
5. At exits and exit stairways serving a required accessible space, but not providing an approved accessible means of egress, signage shall be provided in accordance with Section 1007.10.

Reason: These revisions would be consistent with ADA 216.2, 216.4.1, and 216.10. The intent of this proposal is to add requirements for visual signage where appropriate. In addition, the pictogram for hearing impaired is added for where assistive listening systems are provided.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E221-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.2-E-BALDASSARRA-CTC.docx

E222 – 12
1110.2

Proponent: Jerome Seville, Commonwealth of Pennsylvania representing self (Jseville@pa.gov)

Revise as follows:

1110.2 Directional signage. Directional signage indicating the route to the nearest like *accessible* element shall be provided at the following locations. These directional signs shall include the International Symbol of Accessibility:

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an *accessible route*.
4. At each separate-sex toilet and bathing room indicating the location of the nearest family or assisted-use toilet or bathing room where provided in accordance with Section 1109.2.1.
5. At *exits* and *exit stairways* serving a required *accessible* space, but not providing an *approved accessible means of egress*, signage shall be provided in accordance with Section 1007.10.
6. <u>Where drinking fountains for persons using wheelchairs and drinking fountains for standing persons are not located adjacent to each other, directional signage shall be provided indicating the location of the other drinking fountains.</u>

Reason: IBC 1109.5.1 and 1109.5.2 mandates that at a minimum two drinking fountains are required. One for wheelchair users, one for ambulatory individuals. Should it be determined to locate these fountains at two different locations, signage would assist those disabled individuals locate the accessible drinking fountain.

Cost Impact: None.

E222-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.2-E-Seville.doc

E223-12

1007.8.2, 1007.9, 1007.11, 1011.4, 1022.9, 1110.3 (IFC [B] 1007.8.2, 1007.9, 1007.11, 1011.4, 1022.9)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown.

1. Each assembly area required to comply with Section 1108.2.7 shall provide a sign notifying patrons of the availability of assistive listening systems complying with the ICC A117.1 requirements for visual characters and shall include the International Symbol of Access for Hearing Loss.

   Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems .

2. At each door to an *area of refuge*, an exterior area for assisted rescue, an egress *stairway*, *exit passageway* and *exit discharge*, signage shall be provided in accordance with Section 1011.4.
3. At *areas of refuge*, signage shall be provided in accordance with Section 1007.11.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section 1007.11.
5. At two-way communication systems, signage shall be provided in accordance with Section 1007.8.2.
6. Within interior exit stairways and ramps, floor level signage shall be provided in accordance with Section 1022.9.

1007.8.2 (IFC [B] 1007.8.2) Directions. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system. Signage shall comply with the ICC A117.1 requirements for visual characters.

1007.9 (IFC [B] 1007.9) Signage. Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.3, the signs shall be illuminated. Additionally, visual characters, raised character and braille signage complying with ICC A117.1 shall be located at each door to an *area of refuge* and exterior area for assisted rescue in accordance with Section 1011.4.

1007.11 (IFC [B] 1007.11) Instructions. In *areas of refuge* and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. Signage shall comply with the ICC A117.1 requirements for visual characters. The instructions shall include all of the following:

1. Persons able to use the *exit stairway* do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of *stairs* or supervised operation of elevators and how to summon such assistance.

3. Directions for use of the two-way communications system where provided.

1011.4 (IFC [B] 1011.4) Raised character and Braille exit signs. A sign stating EXIT in visual characters, raised characters and Braille and complying with ICC A117.1 shall be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway, an exit ramp, an exit passageway and the exit discharge.

1022.9 (IFC [B] 1022.9) Stairway identification signs. A sign shall be provided at each floor landing in an *interior exit stairway* and *ramp* connecting more than three stories designating the floor level, the terminus of the top and bottom of the *interior exit stairway* and *ramp* and the identification of the *stair* or *ramp*. The signage shall also state the story of, and the direction to, the *exit discharge* and the availability of roof access from the *interior exit stairway* and *ramp* for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. In addition to the *stairway* identification sign, a floor level sign in visual characters, raised characters and braille complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the *interior exit stairway* and *ramp* into the *corridor* to identify the floor level.

Reason: These revisions would be consistent with ADA 216.2, 216.4.1, and 216.10. The intent of this proposal is to add requirements for visual signage where appropriate. In addition, the pictogram for hearing impaired is added for where assistive listening systems are provided.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E223-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.3-E-BALDASSARRA-CTC.docx

E224 – 12
1022.9, 1110.3 (IFC [B] 1022.9)

Proponent: Sharon Toji, Access Communications, representing self (SharonToji@me.com)

Revise as follows:

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown.

1. Each assembly area required to comply with Section 1108.2.7 shall provide a sign notifying patrons of the availability of assistive listening systems complying with the ICC A117.1 requirements for visual characters and shall include the International Symbol of Access for Hearing Loss. The sign shall be located outside the entrances to the assembly area.
   Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems .
2. At each door to an *area of refuge*, an exterior area for assisted rescue, an egress *stairway*, *exit passageway* and *exit discharge*, signage shall be provided in accordance with Section 1011.4.
3. At *areas of refuge*, signage shall be provided in accordance with Section 1007.11.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section 1007.11.
5. At two-way communication systems, signage shall be provided in accordance with Section 1007.8.2.
6. Within interior exit stairways and ramps, floor level signage shall be provided in accordance with Section 1022.9.

1022.9 (IFC [B] 1022.9) Stairway identification signs. A sign shall be provided at each floor landing in an *interior exit stairway* and *ramp* connecting more than three stories designating the floor level, the terminus of the top and bottom of the *interior exit stairway* and *ramp* and the identification of the *stair* or *ramp*. The signage shall also state the story of, and the direction to, the *exit discharge* and the availability of roof access from the *interior exit stairway* and *ramp* for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. In addition to the *stairway* identification sign, a floor level sign in visual characters, raised characters and braille complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the *interior exit stairway* and *ramp* into the *corridor* to identify the floor level. On the level of exit discharge, a five pointed tactile star shall be placed to the left of the level designator. The diameter of the star shall be equal to the height of the raised character level designator, and shall be translated into contracted braille as "Main."

Reason: Proposed revisions bring the items into compliance with 2010 ADA, and add clarity for requirements for visual signage.

The location for the assistive listening sign is made more precise because the sign is too often located randomly where space is available inside the assembly or conference area, where it is not likely to be noticed or seen. I believe that the intent is to locate it where it will be seen at the entry point.

The five pointed star should be added to the floor designator in stairways, because this sign is to provide information analogous to the elevator hoistway signs, for persons who are blind and visually impaired who are, for various reasons, using the stairway for vertical access, rather than the elevator. It signals that they have reached the exit level, just as the stair does on the elevator hoistways.

Cost Impact: none, or a possible slight reduction in cost at some Areas of Refuge.

E224-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110.3-E-Toji.doc

E225-12
E106 (New)

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION E106
RECREATIONAL FACILITIES

E106.1 Golf Facilities. Golf facilities shall comply with E106.1.1 through E106.1.4.

E106.1.1 Golf Courses. Golf courses shall comply with E106.1.1.1 through E106.1.1.3.

E106.1.1.1 Teeing Grounds. Where one teeing ground is provided for a hole, the teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where two teeing grounds are provided for a hole, the forward teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where three or more teeing grounds are provided for a hole, at least two teeing grounds, including the forward teeing ground, shall be designed and constructed so that a golf car can enter and exit each teeing ground.

E106.1.1.2 Putting Greens. Putting greens shall be designed and constructed so that a golf car can enter and exit the putting green.

E106.1.1.3 Weather Shelters. Where provided, weather shelters shall be designed and constructed so that a golf car can enter and exit the weather shelter and shall be accessible.

E106.1.2 Practice Putting Greens, Practice Teeing Grounds, and Teeing Stations at Driving Ranges. At least 5 percent, but no fewer than one, of practice putting greens, practice teeing grounds, and teeing stations at driving ranges shall be designed and constructed so that a golf car can enter and exit.

E106.1.3 Accessible route. At least one accessible route shall connect accessible elements and spaces within the boundary of the golf course. In addition, accessible routes serving golf car rental areas; bag drop areas; course weather shelters complying with Section E106.1.1.3; course toilet rooms; practice putting greens; practice teeing grounds; and teeing stations at driving ranges complying with Section E106.1.2 shall comply with the accessible route requirements for golf courses in ICC A117.1.

> **Exception:** Accessible golf car passages shall be permitted to be used for all or part of accessible routes required by this section.

E106.1.4 Teeing Grounds. When teeing grounds are being altered, teeing grounds shall comply with Section E106.1.1.1.

> **Exception:** In existing golf courses, the forward teeing ground shall not be required to be one of the teeing grounds on a hole designed and constructed so that a golf car can enter and exit the teeing ground where compliance is not feasible due to terrain.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

This proposal is part of a coordination effort with the 2010 ADA Standard for Accessible Design and the new technical provisions for recreational facilities found in 2009 ICC A117.1 Chapter 11. This overall proposal for recreational facilities has been divided into parts so that the membership can look at each type of recreational facilities on its own merit. The overall intent is to provide access to recreational facilities so that persons with mobility impairments can participate to the best of their ability. The requirements are not intended to change any essential aspects of that recreational activity.

This proposal contains scoping provisions for constructed elements within golf facilities. Where an element within a golf course is subject to the building code, this will ensure that people with disabilities are not excluded from the recreational and business opportunities on the course. Please note that a passage sufficiently wide for a golf car substitutes for an accessible route. Today, golfers with disabilities use accessible golf cars, also known as single-rider carts, that are designed to have little impact on the greens and are operated with one-handed controls. Golfers sit in the swivel seats and position to hit the ball from a seated position. Technical criteria can be found in the 2009 edition of the ICC A117.1, Section 1106 and includes criteria for accessible routes, golf cart passage and weather shelters.

Cost Impact: None – This will be required by the 2010 ADA Standard for Accessible Design.

E225-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E106-E-BALDASSARRA-CTC.docx

E226-12
E107.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

E107.2 Designations. Interior and exterior signs identifying permanent rooms and spaces shall be visual characters, raised characters and braille complying with ICC A117.1. Where pictograms are provided as designations of interior rooms and spaces, the pictograms shall have visual characters, raised characters and braille complying with ICC A117.1.

Reason: The addition of visual character requirements for room designation signage would be consistent with ADA 216.2. These types of signs are required to provided visual characters, raised character and braille. Currently, IBC only requires raised character and braille.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

E226-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E107.2-E-BALDASSARRA-CTC.docx

E227 – 12
Appendix L (New).

Proponent: Stephen V. Skalko Portland Cement Association and Jason Thompson National Concrete Masonry Association representing the Masonry Alliance for Codes and Standards

Add new Appendix L as follows:

APPENDIX L
BUILDING RESILIENCE

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION L101
GENERAL

L101.1 Purpose. The purpose of this appendix is to promote enhanced public health, safety and general welfare and to reduce public and private property losses due to hazards and natural disasters associated with fires, flooding, high winds and earthquakes.

SECTION L102
INTERIOR FINISHES

L102.1 General. *Building* interior finishes shall comply with Sections L102.1 through L102.3.

L102.2 Interior Wall and Ceiling Finishes. Interior wall and ceiling finishes and conform to the requirements of this section.

L102.2.1 Finish by occupancy. Interior wall and ceiling finishes based on occupancy shall conform to the requirements in Table L102.1.

TABLE L102.2
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY

GROUP	EXIT ENCLOSURES AND EXIT PASSAGEWAYS[a]	CORRIDORS	ROOMS AND ENCLOSED SPACES[b]
A-1, A-2	A	A	B
A-3, A-4, A-5	A	A	C
B, E, M, R-1, R-4	A	B	C
F	B	C	C
H	A	A	B
I-1	A	B	B
I-2, I-3, I-4	A	A	B
R-2	B	B	C
R-3	A	C	C
S	B	B	C
U	No Restrictions		

For SI: 1 inch = 25.4 mm, 1 square inch = $0.0929m^2$

a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fire blocked as required by Section 803.11.1.

b. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and rooms or spaces on both sides shall be considered as one. In determining the applicability of the requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.

L102.2.2 Set-out construction. The exception to Section 803.11.2, shall not be permitted.

L102.3 Interior Floor Finishes. The Exception to Section 804.4.2 shall not be permitted.

SECTION L103
FIRE PROTECTION SYSTEMS

L103.1 General. B*uilding* fire protection systems shall comply with Sections L103.1 through L103.3.

L103.2 Standpipes. Standpipes shall comply with the requirements of Sections L103.2.1 through L103.2.3.

L103.2.1 Height. The exceptions 1 and 4 of Section 905.3.1, shall not be permitted

L103.2.2 Stages. The exception to Section 905.3.4, shall not be permitted.

L103.2.3 Protection. The exception to Section 905.4.1, shall not be permitted.

L103.3 Fire Alarm and Detection Systems. Fire alarms and detection systems shall comply with the requirements of Sections L103.3.1 and L103.3.2.

L103.3.1 Group R-1. Exception 2.1 of Section 907.2.8.1, shall not be permitted.

L103.3.2 Group R-2. Exception 2 of Section 907.2.9.1 shall not be permitted

SECTION L104
MEANS OF EGRESS

L104.1 General. B*uilding* means of egress shall comply with Sections L104.1 through L104.6.

L104.2. Accessible Means of Egress. Accessible means of egress shall comply with the requirements of this Section.

L104.2.1 Stairway clear width. Exception 1 of Section 1007.3, shall not be permitted.

L104.2.2 Area of refuge at stairways. Exception 2 of Section 1007.3, shall not be permitted.

L104.2.3 Areas of refuge at elevators. Exception 2 of Section 1007.4, shall not be permitted.

L104.3 Exit Access. Footnote b to Table 1014.3, shall not be permitted.

L104.4 Exits and Exit Access Doorways. Exits and exit access doorways shall comply with the requirements of this Section.

L104.4.1 Group R-2 and R-3. Exception 1 in Section 1015.1 (1), shall not be permitted.

L104.4.2 Separation distance. Exception 2 of Section 1015.2.1, shall not be permitted.

L104.5 Exit Access Travel Distance. Exit access travel distance shall comply with the requirements of this Section.

L104.5.1 Maximum travel distance. Maximum travel distance shall not exceed 200 feet.

L104.5.2 Atrium. Distance limitations through atrium spaces shall conform with Section 404.

L104.5.3 One exit building. Exit access in buildings with one exit shall conform to Section 1021.2.

L104.6 Corridors. Corridors shall comply with the requirements of this Section.

L104.6.1 Corridor wall rating. The fire-resistance rating of corridor walls shall be at least 1-hour.

L104.6.2 Dead ends. Exception 2 in Section 1018.4, shall not be permitted.

REASON: This reason statement has the following two segments to explain the reasons for this change: (A) The code change is explained with specific substantiation; and (B) General background information identifying the need for enhanced property protection and functional resilience for to strengthen the built environment;

(A) The following are reports of dollar loss to property from wind, cold weather and fire disasters.

- The American Society of Civil Engineers reported in *Normalized Hurricane Damage in the United States*, *1900 – 2005,* National Hazard Review, ASCE 2008, that property damage from hurricanes was 81 billion dollars in 2005.
- The National Weather Service reports that U.S. property damage due to winter storms and ice exceeded 1.5 billion dollars in 2009.
- *Fire Losses in the United States During 2009* by the National Fire Protection Association, August 2010 shows that property loss due to structure fires in buildings other than one and two family dwellings was approximately 4.5 billion dollars.

Increasing the stringency of the design criteria of buildings for hazards such as wind, snow or fire results in more robust buildings. Such requirements reduce the amount of energy and resources required for repair, removal, disposal and replacement of building components and systems damaged from these disasters. A further benefit is a reduction in the amount of damaged building materials and content entering landfills.

Additional benefits are enhanced life safety, security and occupant comfort; potentially less demand on community resources required for emergency response; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future.

(B) Minimum building requirements whether through energy codes, plumbing codes, mechanical codes, zoning codes, or basic building codes, do not encourage truly sustainable buildings. This proposal is one of several that attempt to integrate the concepts of the *Whole Building Design Guide* (WBDG) into the International Building Code as a non-mandatory Appendix. This allows adopting jurisdictions the option of incorporating code requirements into the building code to improve the resilience of the built environment without the need to add another code to the community requirements.

The WBDG, developed in partnership between the National Institute of Building Sciences (NIBS) and the Sustainable Building Industries Council (SBIC), has as its key concepts: accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable.

There are numerous references about the economic, societal, and environmental benefits that result when enhanced functional resilience for resource minimization are integrated into building design and construction. Six examples demonstrating the importance and supporting the concepts are:

1. Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities
National Institute of Building Sciences Multi-Hazard Mitigation Council - 2005

One of the findings in this report is "The analysis of the statistically representative sample of FEMA grants awarded during the study period indicates that a dollar spent on disaster mitigation saves society an average of $4." The programs studied often addressed issues and strategies other than enhanced disaster resistance of buildings and other structures. However, more disaster-resistant buildings enhance life safety; reduce costs and environmental impacts associated with repair, removal, disposal, and replacement; and reduce the time and resources required for community recovery.

2. Five Years Later – Are we better prepared?
Institute for Business and Home Safety - 2010

This IBHS report states: "When Hurricane Katrina made landfall on Aug. 29, 2005, it caused an estimated $41.1 billion in insured losses across six states, and took an incalculable economic and social toll on many communities. Five years later, the recovery continues and some residents in the most severely affected states of Alabama, Louisiana and Mississippi are still struggling. There is no question that no one wants a repeat performance of this devastating event that left at least 1,300 people dead. Yet, the steps taken to improve the quality of the building stock, whether through rebuilding or new construction, call into question the commitment of some key stakeholders to ensuring that past mistakes are not repeated." This report indicates that there is a need to implement provisions to make buildings more disaster-resistant. Clearly this suggests that functional resilience should at least be integrated into the design and construction of sustainable buildings.

3. National Weather Service Office of Climate, Water and Weather Services
National Oceanic and Atmospheric Administration (NOAA) - 2010

Data provided on the NOAA website [www.weather.gov/os/hazstats.shtml] indicates that the average annual direct property loss due to natural disasters in the United States exceeds of $35,000,000,000. This does not include indirect costs associated with loss of residences, business closures, and resources expended for emergency response and management. These direct property losses also do not reflect the direct environmental impact due to reconstruction after the disasters. Functional resilience will help alleviate the environmental impact and minimize both direct and indirect losses from natural disasters.

4. ***Global Climate Change Impacts in the United States***

U.S. Global Change Research Program (USGCRP) - 2009

The USGCRP includes the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation; National Aeronautic and Space Administration; Environmental Protection Agency, USA International Development, National Science Foundation and Smithsonian Institution

The report identifies that: "Climate changes are underway in the United States and are projected to grow. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow." The report further identifies that the: "Threats to human health will increase. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts." Key messages in the report on societal impacts include:

- "City residents and city infrastructure have unique vulnerabilities to climate change. "
- "Climate change affects communities through changes in climate-sensitive resources that occur both locally and at great distances."
- "Insurance is one of the industries particularly vulnerable to increasing extreme weather events such as severe storms, but it can also help society manage the risks."

Sustainable building design and construction cannot be about protecting the natural environment without consideration of the projected growth in severe weather. Minimum codes primarily based on past natural events are not appropriate for truly sustainable buildings. Buildings expected to have long term positive impacts on the environment must be protected from these extreme changes in the natural environment. The provisions for improved property protections are necessary to reduce the amount of energy and resources associated with repair, removal, disposal, and replacement due to routine maintenance and damage from disasters. Further such provisions reduce the time and resources required for community disaster recovery.

5. ***Sustainable Stewardship -*** *Historic preservation plays an essential role in fighting climate change ,*

Traditional Building, National Trust for Historic Preservation - 2008

In the article Richard Moe summarizes the results of a study by the Brookings Institution which projects that by 2030 we will have demolished and replaced 82 billion square feet of our current building stock, or nearly 1/3 of our existing buildings, largely because the vast majority of them weren't designed and built to last any longer. Durability, as a component of functional resilience, can reduce these losses.

6. **Opportunities for Integrating Disaster Mitigation and Energy Retrofit Programs**

Senate Environment and Public Works Committee Room, Dirksen Senate Office Building, Washington, D.C. - 2010

During this panel discussion a representative of the National Conference of State Historic Preservation Officers noted that more robust buildings erected prior to 1950 tend to be more adaptable for reuse and renovation. Prior to the mid-1950s most local jurisdictions developed their own building code requirements that uniquely addressed the community's needs, issues and concerns. Pre-1950 building codes typically resulted in more durable and robust construction that lasts longer.

The total environmental impact of insulation, high efficiency equipment, components, and appliances, low-flow plumbing fixtures, and other building materials and contents are relatively insignificant when rendered irreparable or contaminated and must be disposed of in landfills after disasters. The US Army Corps of Engineers estimated that after Hurricane Katrina nearly 1.2 billion cubic feet of building materials and contents ended up in landfills. This is analogous to stacking enough refrigerators a fifth of the way to the moon or placing them end to end around the equator of the Earth twice.

Cost Impact: This proposal will increase the cost of construction

Staff note: This proposal is one of several proposals adding a new appendix L. The intention of the proponent has been indicated that the contents of the proposals be combined if they should be approved into a single Appendix L Titled "Appendix L, Building Resilience."

E227-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX L (NEW) #3-G-SKALKO-THOMPSON.doc

E228 – 12

1022.6, Chapter 35; (IFC [B] 1022.6, Chapter 80) (IMC [B] 601.3, Chapter 15)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

1022.6 (IFC [B] 1022.6) Ventilation. Equipment and ductwork for interior exit stairway and ramp ventilation as permitted by Section 1022.5 shall comply with one of the following items:

1. Such equipment and ductwork shall be located exterior to the building and shall be directly connected to the interior exit stairway and ramp by ductwork enclosed in construction as required for shafts.
2. Where such equipment and ductwork is located within the interior exit stairway and ramp, the intake air shall be taken directly from the outdoors and the exhaust air shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required for shafts.
3. Where located within the building, such equipment and ductwork shall be separated from the remainder of the building, including other mechanical equipment, with construction as required for shafts.
4. Where located within the building, such *equipment* and ductwork shall be separated from the remainder of the building, including other mechanical *equipment*, with ductwork tested and *listed* for not less than 2-hour fire-resistance in accordance with ASTM E2816-11.

In each case, openings into the fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by opening protectives in accordance with Section 716 for shaft enclosures. The interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.

IMC [B] 601.3 Exits. *Equipment* and ductwork for ~~exit enclosure~~ interior exit stairway and ramp ventilation shall comply with one of the following items:

1. Such *equipment* and ductwork shall be located exterior to the building and shall be directly connected to the ~~exit enclosure~~ interior exit stairway and ramp by ductwork enclosed in construction as required by the *International Building Code* for shafts.
2. Where such *equipment* and ductwork is located within the exit enclosure, the intake air shall be taken directly from the outdoors and the *exhaust air* shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required by the *International Building Code* for shafts.
3. Where located within the building, such *equipment* and ductwork shall be separated from the remainder of the building, including other mechanical *equipment*, with construction as required by the *International Building Code* for shafts.
4. Where located within the building, such *equipment* and ductwork shall be separated from the remainder of the building, including other mechanical *equipment*, with ductwork tested and *listed* for not less than 2-hour fire-resistance in accordance with ASTM E2816-11.

In each case, openings into fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by self-closing fire-resistance-rated devices in accordance with the *International Building Code* for enclosure wall opening protectives. ~~Exit enclosure~~ The interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.

Add referenced standard to Chapter 35 (IFC Chapter 80, IMC Chapter 15) as follows:

ASTM E2816-11, *Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems*

Reason: This proposal would allow an additional tested method of protection for duct enclosures used for ventilation of exit enclosures. The ductwork would be permitted to be used if it were protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose. This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criterion provides an alternate to shaft enclosures for vertical ducts.

This Standard has criteria for testing rigid or flexible fire protection enclosure systems (including stability, integrity, and insulation) that are installed on or as part of metallic HVAC ducts, yielding an alternate to required fire-resistance-rated shafts which are required to be protected from both internal and external fire exposure. This criteria provides an alternate to shaft enclosures for horizontal and vertical ducts.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard can evaluate the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment separated by fire resistance rated construction when the HVAC duct system is exposed to fire from the outside of the horizontal or vertical HVAC duct system, or from the outside with hot gases entering the inside of the HVAC duct system from unprotected openings, when subjected to the standard time-temperature curve of ASTM E119.

The change from 'exit enclosure' to 'interior exit stairway and ramp' is for consistency in language between the documents. This was part of E5-09/10 during the last cycle.

Cost Impact: This change will reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

E228-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.6-E-Godwin-NICHOLAS.doc

E229 – 12
1022.6, Chapter 35; (IFC [B] 1022.6, Chapter 80) (IMC [B] 601.3, Chapter 15)

Proponent: John D. Nicholas of Perceptive Solutions LLC representing Unifrax I LLC (john@perceptivesolutionsllc.com)

Revise as follows:

1022.6 (IFC [B] 1022.6) Ventilation. Equipment and ductwork for interior exit stairway and ramp ventilation as permitted by Section 1022.5 shall comply with one of the following items:

1. Such equipment and ductwork shall be located exterior to the building and shall be directly connected to the interior exit stairway and ramp by ductwork enclosed in construction as required for shafts.
2. Where such equipment and ductwork is located within the interior exit stairway and ramp, the intake air shall be taken directly from the outdoors and the exhaust air shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required for shafts.
3. Where located within the building, such equipment and ductwork shall be separated from the remainder of the building, including other mechanical equipment, with construction as required for shafts.
4. A tested and listed fire resistive metallic duct system in compliance with ASTM E2816-11, shall be used as the ductwork or as an enclosure for equipment, or for both ductwork and enclosure purposes.

In each case, openings into the fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by opening protectives in accordance with Section 716 for shaft enclosures. The interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.

IMC [B] 601.3 Exits. *Equipment* and ductwork for ~~exit enclosure~~ interior exit stairway and ramp ventilation shall comply with one of the following items:

1. Such *equipment* and ductwork shall be located exterior to the building and shall be directly connected to the ~~exit enclosure~~ interior exit stairway and ramp by ductwork enclosed in construction as required by the *International Building Code* for shafts.
2. Where such *equipment* and ductwork is located within the exit enclosure, the intake air shall be taken directly from the outdoors and the *exhaust air* shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required by the *International Building Code* for shafts.
3. Where located within the building, such *equipment* and ductwork shall be separated from the remainder of the building, including other mechanical *equipment*, with construction as required by the *International Building Code* for shafts.
4. A tested and listed fire resistive metallic duct system in compliance with ASTM E2816-11, shall be used as the ductwork or as an enclosure for equipment, or for both ductwork and enclosure purposes.

In each case, openings into fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by self-closing fire-resistance-rated devices in accordance with the *International Building Code* for enclosure wall opening protectives. ~~Exit enclosure~~ The interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.

Add referenced standard to Chapter 35 (IFC Chapter 80, IMC Chapter 15) as follows:

<u>ASTM E2816-11, *Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems*</u>

Reason: This proposed code change allows for the use of either a pre-fabricated duct system or field applied enclosure system in lieu shaft enclosures, when these duct systems are tested and listed in accordance with *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* a full consensus test method that was specifically designed to assess both specific end use of the ductwork and its protection materials.

This method of tests also assesses both an internal and external fire threat to the ductwork (refer to the table below) as well as the transition or connection of horizontal ducts to vertical ducts. Fire resistive metallic duct systems tested and listed to ASTM E2816 may provide a higher degree of fire protection. Shaft enclosures tested to ASTM E119 are tested as panels and are not subjected to an engulfment scenario as are fire resistive metallic duct systems tested and listed to ASTM E2816.

ASTM E2816 References
1.4.1 *Condition A*—These test methods provide a means for evaluating a **horizontal** HVAC duct system, **without openings** exposed to fire, passing through a vertical fire-separating element.
1.4.2 *Condition B*—These test methods provide a means for evaluating a **vertical** HVAC duct system, **without openings** exposed to fire and outfitted with a horizontal connection, passing through a horizontal fire-separating element.
1.4.3 *Condition C*—These test methods provide a means for evaluating a **horizontal** HVAC duct system, **with unprotected openings** exposed to fire, passing through a vertical fire-separating element.
1.4.4 *Condition D*—These test methods provide a means for evaluating a **vertical** HVAC duct system with a horizontal connection, and **with unprotected openings** exposed to fire, passing through a horizontal fire-separating element.

This method of tests uses the ASTM E119 time-temperature curve and replicates use of exhaust by using a fan technique to create a negative pressure within the duct similar to that in use. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts. In ASTM E2816, the systems supports are also tested as part of the fire resistance test. ASTM E2816 offers the following tests to assess performance: ASTM E84 for the system's flame spread and smoke developed indices, ASTM E136 for insulation's non-combustibility, ASTM C518 for the insulation's durability and ASTM E814 for the system's ability as a firestop to prevent the spread of fire from compartment to compartment, ASTM E2226 for the resistance to the application of a hose stream, and ASTM C411 for the insulation covering's and lining's ability to resist flaming, glowing, smoldering or smoking while in service, which was just approved in December 2011 and this test method will also become part of the standard upon its latest publication.

ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* cites ASTM E2816-11 to establish requirements for fire protection enclosure systems, applied to metallic HVAC ducts which provide an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations, as well as to determine the characteristics of the system and enclosure material currently cited in the codes.

These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2816 who drafted its first version, as the ANSI Designated Expert to ISO TC92 SC2 WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 1: Ventilation Ducts* and one who has designed, supervised, and overseen HVAC fire tests as part of an international laboratory as well as one who had jurisdiction over the product certification process for products and materials.

The change from 'exit enclosure' to 'interior exit stairway and ramp' is for consistency in language between the documents. This was part of E5-09/10 during the last cycle.

Cost Impact: This change will reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

E229-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1022.6-E- NICHOLAS.doc

2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – STRUCTURAL

(Portions of the International Existing Building Code will be heard by the Structural Committee)

STRUCTURAL CODE COMMITTEE

Marcelino Iglesias - Chair
Code Specialist
State of New Jersey – DCA – Div. of Codes & Standards
Trenton, NJ

Constadino (Gus) Sirakis, PE – Vice Chair
Director of Engineering
NYC Department of Buildings
New York, NY

Alexander H. Abel, PE
Plans Review Engineer
City & County of Denver – Building Department
Denver, CO

Ronald A. Brendel, PE
Senior Plan Review Engineer/Code Development Specialist
City of Saint Louis
St. Louis, MO

Todd Cordill, NCARB
Chief, Plan Review Division
State of Michigan, Bureau of Construction Codes
Lansing, MI

J. Daniel Dolan, PE, Ph.D
Professor and Director of Codes & Standards
Washington State University
Composite Materials and Engineering (CMEC);
Pullman, WA

Wanda D. Edwards, PE
Institute for Business & Home Safety
Tampa, FL

Brian F. Foley, PE
Deputy Building Official
Fairfax County, Virginia
Fairfax, VA

Cole Graveen, PE, SE
Engineer
Raths, Raths & Johnson Inc.
Willowbrook, IL

Steve Knight
Rep: National Association of Home Builders
Owner
Steve L. Knight, PE
Statesville, NC

Therese P. McAllister, PE, PhD
Research Structural Engineer
National Institute of Standards and Technology
Gaithersburg, MD

Gary R. Searer, PE, SE
Associate Principal
Wiss, Janney, Elstner Associates, Inc.
Emeryville, CA

Jonathan C. Siu, PE, SE
Principal Engineer/Building Official
City of Seattle, Dept. of Planning & Development
Seattle, WA

Gary W. Walker, PE
President
Walker Engineering Inc.
Birmingham, AL

Howard Zee, PE, SE
Structural Engineer
City of County of San Francisco,
Department of Building Inspections
San Francisco, CA

Staff Secretariat:
Alan Carr, SE
Senior Staff Engineer
Code and Standards
International Code Council
Washington Resource Center
Bellevue, WA

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

STRUCTURAL
(Including portions of the International Existing Building Code)

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

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

<u>**IEBC**</u>

- EB15-12
- EB16-12
- EB17-12
- EB18-12
- EB19-12
- EB20-12
- EB21-12
- EB22-12
- EB23-12
- EB24-12
- EB25-12
- EB26-12
- EB27-12
- EB28-12
- EB29-12
- EB30-12
- EB31-12
- EB32-12
- EB33-12
- EB34-12
- EB35-12
- EB36-12
- EB37-12
- EB38-12
- EB39-12
- EB40-12
- EB41-12
- EB42-12
    - G213-12, Part I
    - G213-12, Part II
- EB1-12
- EB2-12
- EB3-12
    - EB12-12
    - EB13-12
    - EB14-12
    - G211-12
    - G212-12
    - G214-12
- EB4-12
- EB5-12
    - G218-12
- EB6-12, Part I
- EB6-12, Part II
- EB7-12
- EB8-12
- EB9-12
    - G216-12
- EB10-12
    - G215-12
    - G217-12
    - G221-12, Part I
    - G221-12, Part II
    - G222-12
    - G223-12
    - G224-12, Part I
    - G224-12, Part II
    - G228-12
- EB11-12

<u>**IBC-S**</u>

- S1-12
- S2-12
- S3-12
- S5-12
    - S46-12
    - G20-12
    - G21-12
- S4-12
    - S68-12
- S6-12
- S7-12
- S8-12
- S9-12
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- S12-12
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- S99-12
- S100-12
- S101-12
  - FS146-12
- S102-12
- S103-12
- S104-12
  - G8-12, Part IV
  - P3-12
  - P228-12
  - M31-12
  - P20-12
  - G23-12
  - G24-12
- S105-12
- S106-12
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    FS168-12
    FS192-12
    FS193-12
    FS194-12
    FS195-12
    FS198-12
    S317-12
S313-12
S314-12
S315-12, Part I
S316-12, Part I
    G186-12
    G187-12
    G188-12
    G189-12

EB1–12

[B]301.1.4, [B]301.1.4.1, [B]Table 301.1.4.1, [B]301.1.4.2, [B]Table 301.1.4.2

Proponent: Jennifer Goupil, The Structural Engineering Institute of ASCE (jgoupil@asce.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 301.1.4 Evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*~~, ASCE 31~~ or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

[B] 301.1.4.1 Compliance with IBC level seismic forces. Where compliance with the seismic design provisions of the *International Building Code* is required, the procedures shall be in accordance with one of the following:

1. One-hundred percent of the values in the *International Building Code*. Where the existing seismic force-resisting system is a type that can be designated as “Ordinary,” values of R, Ω_0 and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as “Ordinary” in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system will provide performance equivalent to that of a “Detailed,” “Intermediate” or “Special” system.
2. Compliance with the performance objectives in ASCE 41 ~~using both the BSE-1 and BSE-2 earthquake hazard levels and the corresponding performance levels shown in Table 301.1.4.~~1 Section 2.2.4 based on the assigned Risk Category for the building.

~~[B] TABLE 301.1.4.1~~
~~PERFORMANCE CRITERIA FOR IBC—LEVEL SEISMIC FORCES OCCUPANCY~~

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix Chapters shall be deemed to comply with this section.
   - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
   - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
   - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4. 2.5. Seismic evaluation and design of concrete buildings in all risk categories are permitted to be based on the procedures specified in Chapter A5.

~~3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 301.1.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.~~

~~4.~~ 3. Compliance with the performance objectives in ASCE 41 ~~using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 301.1.4.2. The design spectral response acceleration parameters~~ ~~S_{xs}~~ ~~and~~ ~~S_{x1}~~ ~~specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters~~ ~~S_{DS}~~ ~~and~~ ~~S_{D1}~~ ~~defined by the *International Building Code*~~ Section 2.2.1 based on the assigned Risk Category for the building.

~~[B] TABLE 301.1.4.2~~
~~PERFORMANCE CRITERIA FOR REDUCED IBC—LEVEL SEISMIC FORCES RISK CATEGORY~~

Reason: This proposal has two primary purposes:

1. Replace references to ASCE 31-03 and 41-06 with the updated standard ASCE 41-13, which combined 31 and 41 and contains numerous technical updates, representing the state of the practice for seismic evaluation and rehabilitation of existing buildings.
2. Remove IEBC Tables 301.1.4.1 and 301.1.4.2 and replace with a reference to the related sections of ASCE 41-13. The update standard contains performance objective criteria for both a new building standard equivalent level ("IBC-level seismic forces" in the IEBC), and a basic retrofit level ("reduced IBC-level seismic forces" in the IEBC).

Both of these purposes and a general summary of the changes associated with the new standard are presented below:

ASCE 41-13 Summary

ASCE 41-13 is the culmination of a multi-year, ANSI approved update process for the two seismic evaluation and rehabilitation standards promulgated by ASCE. There are several significant updates to the standards:

- ASCE 31-03 and 41-06 have been combined into one standard for improved consistency and usability. The primary features of the two standards have been maintained, including a three-tiered analysis approach; the use of simplified, experience-based approach for common building types; the use of advance analytical techniques for more complex or unusual buildings.
- Updated seismic hazard and performance objectives, including the addition of a "new building standard equivalent" performance and a change in the seismic hazard determination of the basic performance objective for existing buildings. The new building equivalent utilizes the same seismic hazards as ASCE 7-10. The existing building performance has removed the 0.75 factors on demands that has traditionally been used and instead uses reduced seismic hazards (see below for more detail). This approach is currently used for existing buildings in the 2007 California Building Code.
- Updated and revised checklists for the Tier 1 screening procedure that was in ASCE 31-03.
- Updated provisions for analysis, foundations, and the major materials chapters in ASCE 41-06 based on incorporation of research and practice since ASCE 41-06 was developed.

A public ballot version of the new standard will be available from ASCE in the spring of 2012 and it is expected that it a prepublication (white cover) version will be available prior to the ICC Final Action Hearings in October of 2012. Any person interested in obtaining a public comment copy of ASCE 41-13 may do so by contacting the proponent at jgoupil@asce.org.

Referencing ASCE 41-13 for Seismic Performance

It is our opinion that the table describing the ASCE 41 performance levels is best kept within the standard rather than defining force levels, performance objectives, and interpolation of acceptance criteria in the IEBC. This is consistent with how ASCE 7 works with the IBC. Namely, a building is assigned a Risk Category by the IBC, and then ASCE 7 defines the performance objective for that Risk Category. In ASCE 7 this is done via the seismic importance factor and other limitations contained in the standard. We propose the same method for the IEBC: Risk Category is assigned by the Code (in this case the IEBC), and associated seismic performance is specified by the referenced standard (ASCE 41-13).

Section 301.1.4.1 IBC Level Seismic Forces

This proposal removes the ASCE 41-06 performance levels from the IEBC and instead references a new section in ASCE 41-13 that contains criteria for "New Building Standards Equivalent Performance Objective." The objectives are similar to Table 301.1.4.1 in the 2012 IEBC and are intended to be generally consistent with the IBC and ASCE 7 as referenced in IEBC Section 301.1.4.1 Item 1.

Since ASCE 41-13 Section 2.2.4 addresses both structural and nonstructural items, the revised text references only the structural performance criteria consistent with Table 301.1.4.1 in the IEBC.

If kept within the IEBC, an updated version of Table 301.1.4.1 would be as follows:

TABLE 301.1.4.1

PERFORMANCE CRITERIA FOR IBC-LEVEL SEISMIC FORCES

RISK CATEGORY (BASED ON IBC TABLE 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1N EARTHQUAKE HAZARD LEVEL	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety ~~(LS)~~	Collapse Prevention ~~(CP)~~
II	Life Safety ~~(LS)~~	Collapse Prevention ~~(CP)~~

III	Damage Control ~~Note a~~	Limited Safety ~~Note a~~
IV	Immediate Occupancy ~~(IO)~~	Life Safety ~~(LS)~~

~~a. Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance, but need not be less than the acceptance criteria specified for Risk Category IV performance levels.~~

Therefore, this part of the proposal effectively has two substantive revisions to the 2012 version of Table 301.1.4.1 based on the updates in ASCE 41-13:

1. BSE-1N and BSE-2N in ASCE 41-13 are similar to the BSE-1 and BSE-2 in ASCE 41-06 except that they are based on the MCE_R ground motions consistent with ASCE 7-10. In addition whereas the BSE-1 in ASCE 41-06 was taken as the lesser of 2/3MCE and earthquake exceedance probability of 10% in 50 years, the BSE-1N is defined as MCE_R without considering the earthquake exceedance probability of 10% in 50 years.
2. The interpolation for Risk Category III has been changed from 80% of Risk Category IV to halfway between Risk Category II and Risk Category IV based on the definitions of "Damage Control" and "Limited Safety" in ASCE 41-13. Based on review and modifications to the acceptance criteria during the development of ASCE 41-06, the halfway interpolation better reflects the intent of the ASCE 7-10 Importance Factors for Risk Category III. Note also that the halfway interpolation is consistent with how the IEBC treated Risk Category III prior to 2009.

Section 301.1.4.2 Reduced IBC Level Seismic Forces

This proposal removes the ASCE 41-06 performance levels from the IEBC and instead references the section in ASCE 41-13 that contains criteria for "Basic Performance Objective for Existing Buildings." The objectives are similar to Table 301.1.4.2 in the 2012 IEBC and are intended to be generally consistent with the traditional approach for reduced seismic forces (75% of new code).

Since ASCE 41-13 Section 2.2.1 addresses both structural and nonstructural items, the revised text references only the structural performance criteria consistent with Table 301.1.4.1 in the IEBC.

ASCE 41-13 contains a three-tiered approach with Tiers 1 and 2 taken from ASCE 31-03 and Tier 3 being the Systematic Method from ASCE 41-06. Therefore, effectively the methods in ASCE 41-13 as referenced in new Item 3 and the same as those referenced in 2012 IEBC Items 3 and 4.

If kept within the IEBC, an updated version of Table 301.1.4.1 would be as follows:

TABLE 301.1.4.2

PERFORMANCE CRITERIA FOR REDUCED IBC-LEVEL SEISMIC FORCES

RISK CATEGORY (BASED ON IBC TABLE 1604.5)	~~PERFORMANCE LEVEL FOR USE WITH ASCE 31~~	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL
I	~~Life Safety (LS)~~	Life Safety ~~(LS)~~
II	~~Life Safety (LS)~~	Life Safety ~~(LS)~~
III	~~Note a~~	Damage Control Note a
IV	~~Immediate Occupancy (IO)~~	Immediate Occupancy ~~(IO)~~

a. For Risk Category III, the ASCE 41 Tier 1 Screening checklists shall be based on the Life Safety Performance Level, except that checklists statements using the Quick Check procedures of ASCE 41 Section 4.5.3 shall be to a demand to capacity ratio based on the average of the demand to applicable capacity ratio for Life Safety and Immediate Occupancy.

~~a. Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance, but need not be less than the acceptance criteria specified for Risk Category IV performance levels.~~

~~b. For Risk Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.~~

Therefore, this part of the proposal effectively has four substantive revisions:

1. The BSE-1E is a newly defined seismic hazard in ASCE 41-13 intended for the Basic Performance Objective for existing buildings. The hazard level is defined as an earthquake with a 20% exceedance probability in 50 years, which is generally consistent with a 10% in 50 year earthquake with the 0.75 factor that was built into the ASCE 31-03 methodology for seismic evaluation.
2. The interpolation for Risk Category III has been changed from 80% of Risk Category IV to halfway between Risk Category II and Risk Category IV based on the definitions of "Damage Control" in ASCE 41-13. Based on review and modifications to the acceptance criteria during the development of ASCE 41-06, the halfway interpolation better reflects the intent of the ASCE 7-10 Importance Factors for Risk Category III. Note also that the halfway interpolation is consistent with how the IEBC treated Risk Category III prior to 2009.
3. The performance objectives for the Tier 1 and Tier 2 procedures in ASCE 41-13 consists of a single check (one performance level and seismic hazard combination), consistent with ASCE 31-03 as referenced in the 2012 IEBC. Due to seismic hazard reduction (from 2/3 MCE to 20% in 50 year) combined with the elimination of the ASCE 31-03 0.75 factor, the effective performance objective for Tier 1 and Tier 2 is similar to what the 2012 IEBC Table 301.4.2 specifies for ASCE 31-03.
4. The performance objective for the Tier 3 procedure in ASCE 41-13 consists of a dual check (two performance level and seismic hazard combination), which differs from how the 2012 IEBC references ASCE 41-06. The inclusion of the second seismic hazard (BSE-2E defined as 5% in 50 year) is intended to offset the effect of the hazard reduction from the ASCE 41-06 BSE-1 (10% in 50 year) to the ASCE 41-13 BSE-1E (20% in 50 year). Therefore, the dual level check proposed is intended to be generally consistent with the single level check in 2012 IEBC Table 301.1.4.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This code change proposal references ASCE standard 41, which is already referenced in this code. However, the proposed change to code text is written to correlate with a new edition of the standard ASCE 41-13, rather than the edition presently referenced in the code, which is the 06 edition. The 13 edition of this standard is not yet completed, published and available. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved by the Administrative Code Committee, the code text will revert to the text as it appears in the 2012 Edition of the code. Additionally, if the standard update is approved but the document is not published and available by December 1, 2014, an errata will be issued to the code that will return the affected code text to the text as it appears in the 2012 edition of the code.

EB1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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EB2–12
[B]301.1.4, [B]301.1.5 (NEW), Chapter 16 (NEW)

Proponent: Matthew Senecal, P.E., American Concrete Institute

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 301.1.4 Seismic evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*, ASCE 31 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

[B] 301.1.5 Concrete evaluation and design procedures. Non-seismic evaluation and design of structural concrete shall be in accordance with the requirements of ACI 562.

Add new standard to Chapter 16 as follows:

ACI

562-12 - Code Requirements for Evaluation, Repair, and Rehabilitation of Concrete Buildings

Reason: There are no general evaluation and design criteria for concrete structures in the IEBC. ASCE 31, ASCE 41, and Appendix A of this code provide direction for particular structural systems in high seismic areas. ACI 562 is a new referenced standard addressing non-seismic evaluation and design of concrete structures. ACI 562 is compatible with the principles of this code, ASCE 31, and ASCE 41.

Cost Impact: The code change proposal will set a minimum standard for the repair or rehabilitation of concrete structures; therefore, the cost of construction may increase or decrease depending on the standard of practice of the local jurisdiction.

Analysis: A review of the standard proposed for inclusion in the code ACI 562-12 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

EB2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

301.1.4-EB-SENECAL.doc

EB3–12
[B]301.1.4.2, [B]A502.1

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix A Chapters shall be deemed to comply with this section.
   2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
   2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
   2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
   2.5. Seismic evaluation and design of concrete buildings ~~in all risk categories are~~ assigned to risk category I, II or III is permitted to be based on the procedures specified in Chapter A5.
3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 301.1.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 301.1.4.2. The design spectral response acceleration parameters S_{XS} and S_{X1} specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the *International Building Code*.

Revise as follows:

[B] A502.1 Scope. The provisions of this chapter shall apply to all buildings having concrete floors or roofs supported by reinforced concrete walls or by concrete frames and columns. This chapter shall not apply to buildings with roof diaphragms that are defined as flexible diaphragms by the building code, and shall not apply to concrete frame buildings with masonry infilled walls. Buildings that were designed and constructed in accordance with the seismic provisions of the 1993 *BOCA National Building Code*, the 1994 *Standard Building Code*, the 1976 *Uniform Building Code*, the 2000 *International Building Code* or later editions of these codes shall be deemed to comply with these provisions, unless the seismicity of the region has increased since the design of the building.

Exception: This chapter shall not apply to ~~concrete~~ buildings ~~where Seismic Design Category A is permitted~~ assigned to risk category IV.

Reason: This proposal clarifies the eligibility of buildings to use Appendix Chapter A5, with coordinated revisions to Chapter 3 and Chapter A5. Two changes are proposed:

- Chapter A5 is intended to improve a building's performance with respect to safety but not necessarily with respect to post-earthquake functionality or recovery. As such, it is not appropriate for buildings assigned to risk category IV. The proposal makes appropriate revisions to Chapter 3 and Chapter A5.
- The current Chapter A5 text says the chapter does not "apply" to SDC A; commentary explains that this is based on the low seismicity associated with SDC A. There is no technical reason why the chapter's provisions cannot be used for these buildings, however, so that confusing "limitation" is removed.

Cost Impact: The code change proposal will not increase the cost of construction.

EB3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

301.1.4.2-EB-BONOWITZ.doc

EB4–12
[B] 706.3.2

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm <u>of a building</u> or section of a building located where the ~~basic wind speed is greater than 90 mph~~ <u>ultimate design wind speed is greater than 155 mph</u> or in a special wind region, as defined in Section 1609 of the *International Building Code*, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code*.

> <u>**Exception:** One-and two-family dwellings need not be evaluated or strengthened.</u>

Reason: This proposal corrects a printing error makes the following three changes:

- It makes the wind speed trigger less conservative, raising it from a BWS or nominal value of 90 mph to 120 mph. The current value (BWS = 90) is too low and has the effect of triggering retrofit work in many inland areas unnecessarily and without historical basis. BWS of 120 mph, or UDWS of 155 mph, is thought to be adequate, as it covers the critical coastal areas.
- It converts from the old Basic Wind Speed of 120 mph to the new mapped Ultimate Design Wind Speed of 155 mph, based on IBC Table 1609.3.1. This change is essentially administrative, for purposes of consistent terminology.
- It exempts houses. Many jurisdictions already cover houses with the IRC and exempt them entirely from IBC and IEBC provisions. In these cases the proposed exception makes no difference. Where the IBC or IEBC applies, this exception is considered prudent so as not to discourage very common and beneficial reroofing projects.

Note that by using a single wind speed value, the provision will now automatically cover different areas for buildings in different risk categories (see IBC Figures 1609A through 1609C). This is appropriate.

Finally, addition of the words "of a building" in the first sentence corrects what appears to be a printing error in the first printing of the 2012 IEBC. Those words were present in the 2009 edition and were not removed by any approved changes (though they were missing in the monographs from the last cycle). Ideally, this correction should be made through published errata.

Cost Impact: The code change proposal will not increase the cost of construction. Possible cost reduction.

EB4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

706.3.2-EB-BONOWITZ.doc

EB5–12
[B] 706.3.2

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the ~~basic~~ ultimate design wind speed V_{ult}, determined in accordance with Figure 1609A of the *International Building Code* is greater than ~~90~~ 115 mph or in a special wind region, as defined in Section 1609 of the *International Building Code*, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code*.

Reason: The purpose of this proposal is to correlate basic wind speed triggers in the IEBC with the IBC. The 2012 IBC adopted new ultimate-strength basis wind speed maps from ASCE 7-10. A conversion factor from the ultimate wind speed selected from the new maps (V_{ult}) down to the old allowable-stress level wind speed (V_{asd}) was introduced into the IBC to accommodate triggers for special requirements in high-wind regions, tables limiting the use of ballasted roofs at certain heights and wind speeds, and tables for proper selection of shingles and other roofing materials for wind resistance. Unfortunately, this conversion was not introduced into the IEBC, with the result that provisions which were supposed to apply only in high-wind regions now appear to apply across the entire United States. This proposal not only corrects this oversight, it fully updates the IEBC provisions to match the 2012 IBC and ASCE 7-10.

Cost Impact: The code change proposal will not increase the cost of construction.

EB5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

706.3.2-EB-EHRLICH.doc

EB6–12
[B] 807.5, [IBC] 3404.4

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS IS A TWO PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE AS TWO SEPARATE CODE CHANGES. SEE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

PART I - IEBC

Revise as follows:

[B] 807.5 Existing structural elements resisting lateral loads. ~~*Alterations* affecting the demands or capacities of existing elements of the lateral load-resisting system shall be evaluated using the wind provisions of the *International Building Code* and the reduced IBC-level seismic forces. Any existing lateral load-resisting structural elements whose demand-capacity ratio with the *alteration* considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be brought into compliance with those wind and seismic provisions. In addition, the *alteration* shall not create a structural irregularity prohibited by ASCE 7 unless the entire structure complies with Section 301.1.4.2. For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of *additions* and *alterations* since the original construction.~~ <u>Except as permitted by Section 807.6, where the alteration increases design lateral loads, or where the alteration results in prohibited structural irregularity as defined in ASCE 7, or where the alteration decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the wind and seismic provisions of the *International Building Code*. Reduced IBC-level seismic forces shall be permitted.</u>

> <u>**Exception:** Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is no more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per IBC Sections 1609 and 1613. Reduced IBC-level seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction.</u>

PART II – IBC STRUCTURAL

Revise as follows:

3404.4 Existing structural elements carrying lateral load. Except as permitted by Section 3404.5, where the *alteration* increases design lateral loads in accordance with Section 1609 or 1613, or where the *alteration* results in a <u>prohibited</u> structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the requirements of Sections 1609 and 1613.

> **Exception:** Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is no more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.

Reason: The proposal rewrites IEBC Section 807.5 using the clearer logic of IBC Section 3404.4. No change in scope or effect is intended. In applying the clearer wording, however, the scope of triggered work associated with the creation of a prohibited irregularity is slightly changed, from full compliance without exception to the usual compliance eligible for the 10 percent DCR exception. This is appropriate, and the resulting IEBC provision will be consistent with the corresponding IBC provision, except that the IEBC criteria will continue to allow the use of reduced seismic forces.

The proposal also modifies IBC Section 3404.4 for consistency by inserting the word “prohibited” in one place.

Cost Impact: The code change proposal will not increase the cost of construction.

EB6-12
PART I - IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II - IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

807.5-EB-BONOWITZ.doc

EB7–12
[B] 907.4.2

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 907.4.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural *alteration* within a five-year period, the evaluation and analysis shall demonstrate that the lateral load resisting system of the altered building or structure complies with the *International Building Code* for wind loading and with reduced IBC-level seismic forces. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

Reason: This proposal clarifies the long-standing intent of the IEBC that alteration-triggered structural upgrade applies to the (designated or *de facto*) lateral system only, and not to the gravity system or to nonstructural components.

Cost Impact: The code change proposal will not increase the cost of construction.

EB7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

907.4.2-EB-BONOWITZ.doc

EB8–12
[B] 907.4.2, [B] 907.4.3 (NEW), [B] 907.4.4

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 907.4.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural *alteration* within a five-year period, the evaluation and analysis shall demonstrate that the lateral load-resisting system of the altered building or structure complies with the *International Building Code* for wind loading and with reduced IBC-level seismic forces. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

[B]907.4.3 Seismic Design Category F. Where the building is assigned to seismic design category F, the evaluation and analysis shall demonstrate that the lateral load-resisting system of the altered building or structure complies with reduced IBC-level seismic forces and with the wind provisions applicable to a limited structural alteration.

~~**[B] 907.4.3**~~ **907.4.4 Limited structural alteration.** Where the work does not involve a substantial structural *alteration* and the building is not assigned to seismic design category F, the existing elements of the lateral load-resisting system shall comply with Section 807.5.

Reason: This proposal adds a new category of triggered seismic upgrade for the most vulnerable buildings undergoing Level 3 Alteration. Currently, alteration triggers seismic upgrade only when the alteration project makes intentional structural changes that add up to a "substantial structural alteration" (Section 907.4.2). A top-to-bottom architectural and mechanical renovation, however, triggers no seismic mitigation. This proposal fills some of that mitigation gap.

The proposal covers only buildings assigned to Seismic Design Category F. SDC F buildings are those in the highest seismicity *and* of the greatest importance to post-earthquake response and recovery (risk category IV). If any buildings are deserving of triggered upgrades when their lives are significantly extended through major alterations, these are. Many such buildings (California hospitals, for example) are already addressed by targeted legislation, so will not be affected by the proposed trigger. Yet many jurisdictions with substantial seismic risks do not have histories of proactive mitigation and lack the code mechanism to enforce these common-sense improvements to essential facilities. These jurisdictions look to the model codes for best practices.

The proposal borrows language and concepts, specifically the use of reduced loads, from the current trigger in Section 907.4.2. By limiting the scope and criteria, the proposal properly balances regulatory benefits with potential owner costs. (See also the Cost Impact statement below for mitigating factors.)

The proposal makes two associated revisions in addition to adding new Section 907.4.3:

- In Section 907.4.2, the long-standing intent that triggered upgrades address only structural systems and do not require nonstructural compliance is clarified by adding a few words.
- In current Section 907.4.3 (to be renumbered 907.4.4), reference to the proposed SDC F trigger is added to maintain the logical flow.

Cost Impact: Undetermined: Buildings assigned to SDC F that undergo Level 3 Alteration will be subject to seismic upgrade. However, 1) it is not known how many such buildings exist, 2) many such buildings already have made or would make seismic improvements voluntarily, especially as part of a major alteration, 3) many such buildings would pass the triggered evaluation anyway and would not entail any additional cost, and 4) owners can avoid the triggered work by limiting their scope of alteration.

EB8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

907.4.3-EB-BONOWITZ.doc

EB9–12
[B] 907.4.4

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 907.4.4 Wall anchors for concrete and masonry buildings. For any building assigned to Seismic Design Category D, E or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm ~~or~~ <u>and any building assigned to Seismic Design Category C, D, E, or F with a structural system consisting of</u> unreinforced masonry walls with any type of roof diaphragm, the alteration work shall include installation of wall anchors at the roof line to resist the reduced IBC-level seismic forces, unless an evaluation demonstrates compliance of existing wall anchorage.

Reason: This proposal extends a common-sense seismic mitigation provision from SDC D-F into SDC C.

The proposal is motivated by damage patterns observed throughout the east coast from the 2011 Virginia earthquake and by the recognition that most jurisdictions where SDC C is prevalent do not have histories of proactive mitigation. Rather, they look to the model codes for best practices. This proposal is modeled on successful practice in Massachusetts, an SDC C jurisdiction that *has* been proactive regarding mitigation and adaptive reuse of unreinforced masonry buildings.

The proposal does represent an increase in potentially triggered work, but the increase is measured and prudent. The proposal only applies to URM bearing walls. A lack of roof-to-wall anchors, especially when paired with unbraced URM parapets, poses a remaining risk throughout areas of moderate and high seismicity. Also the proposal is only triggered by Level 3 Alterations where the intended work area already exceeds 50 percent of the building. The triggered wall anchorage represents a small additional cost by comparison, and one that makes sense where significant resources are being spent to modernize a URM building.

Cost Impact: URM buildings assigned to SDC C that undergo Level 3 Alteration will require wall anchors. The cost is considered small compared with the typical cost of a Level 3 Alteration.

EB9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

907.4.4-EB-BONOWITZ.doc

EB10–12

[B] 907.4.5

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 907.4.5 Bracing for unreinforced masonry parapets. Parapets constructed of unreinforced masonry in buildings assigned to Seismic Design Category <u>C,</u> D, E or F shall have bracing installed as needed to resist the reduced IBC-level seismic forces, unless an evaluation demonstrates compliance of such items.

Reason: This proposal extends a common-sense seismic mitigation provision from SDC D-F into SDC C.

The proposal is motivated by damage patterns observed throughout the east coast from the 2011 Virginia earthquake and by the recognition that most jurisdictions where SDC C is prevalent do not have histories of proactive mitigation. Rather, they look to the model codes for best practices. This proposal is modeled on successful practice in Massachusetts, an SDC C jurisdiction that *has* been proactive regarding mitigation and adaptive reuse of unreinforced masonry buildings.

The proposal does represent an increase in potentially triggered work, but the increase is measured, prudent, and cost-effective:

- The proposal only applies to URM parapets. Unbraced URM parapets remain the most widespread, vulnerable, and dangerous structural elements in earthquakes, as we have seen in several recent non-California events, including Virginia, Wells, NV, and Christchurch, NZ.
- Parapet bracing has a long history and is effective. Los Angeles required URM parapet bracing in 1949.
- Parapet bracing is not intrusive, as it can be done from outside the building.
- The proposal is only triggered by Level 3 Alterations where the intended work area already exceeds 50 percent of the building. The triggered parapet bracing represents a small additional cost by comparison, and one that makes sense where significant resources are being spent to modernize a URM building.

Cost Impact: Minor: URM buildings assigned to SDC C that undergo Level 3 Alteration will become subject to parapet bracing. The cost of parapet bracing is small compared with the typical cost of a Level 3 Alteration.

EB10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

907.4.5-EB-BONOWITZ.doc

EB11–12
[B] 1007.3.1

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 1007.3.1 Compliance with the *International Building Code* level seismic forces. Where a building or portion thereof is subject to a *change of occupancy* that results in the building being assigned to a higher risk category based on Table 1604.5 of the *International Building Code*; or where such *change of occupancy* results in a reclassification of a building to a higher hazard category as shown in Table 1012.4; or where a change of a Group M occupancy to a Group A, E, I-1, R-1, R-2 or R-4 occupancy with two-thirds or more of the floors involved in Level 3 *alteration* work, the building shall comply with the requirements for *International Building Code* level seismic forces as specified in Section 301.1.4.1 for the new risk category.

Exceptions:

1. ~~Group M~~ Any occupancies being changed to Group A, E, I-1, M, R-1, R-2 or R-4 occupancies without an increase in risk category,for buildings less than six stories in height ~~and in~~ assigned to Seismic Design Category A, B or C.
2. Where approved by the *code official*, specific detailing provisions required for a new structure are not required to be met where it can be shown that an equivalent level of performance and seismic safety is obtained for the applicable risk category based on the provision for reduced *International Building Code* level seismic forces as specified in Section 301.1.4.2.
3. Where the area of the new occupancy with a higher hazard category is less than or equal to 10 percent of the total building floor area and the new occupancy is not classified as Risk Category IV. For the purposes of this exception, buildings occupied by two or more occupancies not included in the same Risk category, shall be subject to the provisions of Section 1604.5.1 of the *International Building Code*. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.
4. Unreinforced masonry bearing wall buildings in Risk Category III when assigned to Seismic Design Category A or B shall be allowed to be strengthened to meet the requirements of Appendix Chapter A1 of this code [Guidelines for the Seismic Retrofit of Existing Buildings (GSREB)].

Reason: This proposal extends the seismic upgrade waiver currently provided in Exception 1.

Currently, Section 1007.3.1 triggers seismic upgrade for certain changes of occupancy from one “hazard category” to another, defined by Table 1012.4. It makes special provisions, both in the triggers and the exceptions, for Group M buildings. In particular, Exception 1 waives the upgrade requirement for certain changes from Group M within hazard category 3, presumably based on the relative seismic risk of the different HC 3 occupancies. But the hazard categories are defined in terms of egress, and there really is no rational basis in seismic terms for singling out Mercantile occupancies. Any seismic risk posed (or avoided) by a Group M building is certainly also posed (or avoided) by many Group B, F, S, U, or R-3 buildings, but the latter group are all assigned to HC 4 and are therefore targeted for seismic upgrades in ways that Group M buildings are not. This does not make sense, and it has the effect of discouraging beneficial adaptive reuse projects for existing Group B and F buildings.

The proposal therefore extends the Exception 1 waiver to other occupancies regardless of their hazard category. The provisos regarding building height and SDC remain, so only relatively low risk buildings are getting a new waiver. Also, if the Risk Category changes, the waiver does not apply.

Note that even under this proposal, Section 1007.3.1 will remain more conservative with respect to seismic upgrade triggers than IBC Section 3408, which triggers seismic upgrade only for a change in risk category, regardless of occupancy group.

Cost Impact: The code change proposal will not increase the cost of construction.

EB11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.3.1-EB-BONOWITZ.doc

EB12–12
[B]1103.3

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 1103.3 Lateral force-resisting system. The lateral force-resisting system of *existing buildings* to which additions are made shall comply with Sections 1103.3.1, 1103.3.2 and 1103.3.3.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. ~~In other *existing buildings* where the lateral-force story shear in any story is not increased by more than 10 percent cumulative~~.

<u>2. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is no more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction.</u>

Reason: The proposal follows the precedent set in the 2006 IBC, making the exception to lateral system upgrade element-based, as opposed to story-based. The intent is that elements triggered for lateral upgrade by Section 1103.3.1 or 1103.3.2 should be exempt based on their individual demand-capacity ratios, not on the overall story shear. A focus on story shear can miss critical individual elements in vertical additions and can be difficult to define in the case of horizontal additions. The language of the proposed exception is taken from IBC Section 3403.4.

Cost Impact: The code change proposal will not increase the cost of construction.

EB12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.3-EB-BONOWITZ.doc

EB13–12
[B] 1103.5

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 1103.5 Flood hazard areas. *Additions* and foundations in *flood hazard areas* shall comply with the following requirements:

1. For horizontal *additions* that are structurally interconnected to the *existing building*:
   1.1. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the *International Building Code*.
   1.2. If the *addition* constitutes *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the *International Building Code*.
2. For horizontal *additions* that are not structurally interconnected to the *existing building*:
   2.1. The *addition* shall comply with Section 1612 of the *International Building Code*.
   2.2. If the *addition* and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* and the *addition* shall comply with Section 1612 of the *International Building Code*.
3. For vertical additions and all other proposed work that, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612 of the *International Building Code*.
4. For a ~~new, replacement,~~ raised~~,~~ or extended foundation, if the foundation work and all other proposed work, when combined, constitute *substantial improvement*, the *existing building* shall comply with Section 1612 of the *International Building Code.*
5. <u>For a new foundation or replacement foundation, the foundation shall comply with Section 1612 the *International Building Code*.</u>

Reason: New foundations and replacement foundations are new structures and should comply with the code requirements for new structures rather than be treated the same as raised/extended foundations. The situation with a new or replacement foundation is similar to relocated or moved buildings which are covered by Chapter 13. Section 1302.6 requires the foundations for moved or relocated buildings to comply with the requirements for new structures.

Cost Impact: This provision applies to projects that already propose to build a new foundation or a replacement foundation. Because new and replacement foundations should already be considered new structures, there shouldn't be any increase in cost. However, given how the existing language is written, there will be a cost increase only for those foundations that would not have been determined to be substantial improvement.

EB13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.5-EB-INGARGIOLA-WILSON-QUINN.doc

EB14–12
[B]1302.6

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]1302.6 Flood hazard areas. If relocated or moved into a flood hazard area, structures shall comply with Section 1612 of the *International Building Code* <u>or Section R322 of the *International Residential Code*, as applicable</u>.

Reason: Section 1302.2 already specifies that the foundation system of relocated buildings shall comply with the IBC or IRC, as applicable. As currently written, Section 1302.6 does not allow use of the flood resistant requirements of the IRC. This proposal clarifies that the provisions of the International Residential Code may be used, if applicable to the occupancy.

Cost Impact: The cost for some residential foundations may be lower because the prescriptive provisions of the IRC can be used, rather than requiring a registered design professional for all foundation system for relocated homes.

EB14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1302.6-EB-INGARGIOLA-WILSON-QUINN.doc

EB15–12
[B]A103

Proponent: Marko Schotanus, Chair, Existing Buildings Committee, Structural Engineers Association of California (mschotanus@ruthchek.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SECTION A103
DEFINITIONS

For the purpose of this chapter, the applicable definitions in the building code shall also apply.

[B] POINTING. The partial reconstruction of the ~~bed~~ joints of an unreinforced masonry wall as defined in UBC Standard 21-8.

Reason: Pointing is not limited to bed joints. The chapter provisions also intend that deterioration in head joints should be considered.

Cost Impact: The code change proposal will not increase the cost of construction.

EB15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A103-POINTING-EB-SCHOTANUS.doc

EB16–12

[B] A105.3, [B] A107.3, [B] A107.4, [B] Table A1-E, [B]A107.5 (NEW), [B]A107.5.1 (NEW), [B]A107.5.2 (NEW), [B]A107.5.3 (NEW), [B]A107.5.4, [B]Chapter A6 (New)

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A105.3 Requirements for plans. The following construction information shall be included in the plans required by this chapter:

1. Dimensioned floor and roof plans showing existing walls and the size and spacing of floor and roof-framing members and sheathing materials. The plans shall indicate all existing and new crosswalls and shear walls and their materials of construction. The location of these walls and their openings shall be fully dimensioned and drawn to scale on the plans.
2. Dimensioned wall elevations showing openings, piers, wall classes as defined in Section A106.3.3.8, thickness, heights, wall shear test locations, cracks or damaged portions requiring repairs, the general condition of the mortar joints, and if and where pointing is required. Where the exterior face is veneer, the type of veneer, its thickness and its bonding and/or ties to the structural wall masonry shall also be noted.
3. The type of interior wall and ceiling materials, and framing.
4. The extent and type of existing wall anchorage to floors and roof when used in the design.
5. The extent and type of parapet corrections that were previously performed, if any.
6. *Repair* details, if any, of cracked or damaged unreinforced masonry walls required to resist forces specified in this chapter.
7. All other plans, sections and details necessary to delineate required retrofit construction.
8. The design procedure used shall be stated on both the plans and the permit application.
9. Details of the anchor prequalification program required by ~~UBC Standard 21-7~~ Section A107.5.3, I f used, including location and results of all tests.

[B] A107.3 Existing wall anchors. Existing wall anchors used as all or part of the required tension anchors shall be tested in pullout according to ~~UBC Standard 21-7~~ Section A107.5.1. The minimum number of anchors tested shall be four per floor, with two tests at walls with joists framing into the wall and two tests at walls with joists parallel to the wall, but not less than 10 percent of the total number of existing tension anchors at each level.

[B] A107.4 New bolts. All new embedded bolts shall be subject to periodic special inspection in accordance with the building code, prior to placement of the bolt and grout or adhesive in the drilled hole. Five percent of all bolts that do not extend through the wall shall be subject to a direct-tension test, and an additional 20 percent shall be tested using a calibrated torque wrench. Testing shall be performed in accordance with ~~UBC Standard 21-7~~ Section A107.5. New bolts that extend through the wall with steel plates on the far side of the wall need not be tested.

> **Exception:** Special inspection in accordance with the building code may be provided during installation of new anchors in lieu of testing.

All new embedded bolts resisting tension forces or a combination of tension and shear forces shall be subject to periodic special inspection in accordance with the building code, prior to placement of the bolt and grout or adhesive in the drilled hole. Five percent of all bolts resisting tension forces shall be subject to a direct-tension test, and an additional 20 percent shall be tested using a calibrated torque wrench.

Testing shall be performed in accordance with ~~UBC Standard 21-7~~ Section A107.5. New through-bolts need not be tested.

[B] TABLE A1-E
STRENGTH VALUES OF NEW MATERIALS USED IN CONJUNCTION WITH EXISTING CONSTRUCTION

e. Other bolt sizes, values and installation methods may be used, provided a testing program is conducted in accordance with ~~UBC Standard 21-7~~ Section A107.5.3. The ~~useable~~ strength value shall be determined by multiplying the calculated allowable value, ~~as~~ determined ~~by UBC Standard 21-7~~ in accordance with Section A107.5.3, by 3.0, and the ~~useable~~ usable value shall be limited to a maximum of 1.5 times the value given in the table. Bolt spacing shall not exceed 6 feet (1829 mm) on center and shall not be less than 12 inches (305 mm) on center.

(Portions of Table not shown remain unchanged)

[B]A107.5 Tests of anchors in unreinforced masonry walls.

[B]A107.5.1 Direct tension testing of existing anchors and new bolts. The test apparatus shall be supported by the masonry wall. The distance between the anchor and the test apparatus support shall not be less than one half the wall thickness for existing anchors and 75 percent of the embedment for new embedded bolts. Existing wall anchors shall be given a preload of 300 pounds (1335 N) prior to establishing a datum for recording elongation. The tension test load reported shall be recorded at 1/8 inch (3.2 mm) relative movement between the existing anchor and the adjacent masonry surface. New embedded tension bolts shall be subject to a direct tension load of not less than 2.5 times the design load but not less than 1,500 pounds (6672 N) for five minutes (10 percent deviation).

[B]A107.5.2 Torque testing of new bolts. Bolts embedded in unreinforced masonry walls shall be tested using a torque-calibrated wrench to the following minimum torques:

1/2-inch-diamter (13 mm) bolts: 40 foot pounds (54.2 N-m)
5/8-inch-diamter (16 mm) bolts: 50 foot pounds (67.8 N-m)
3/4-inch-diamter (19 mm) bolts: 60 foot pounds (81.3 N-m)

[B]A107.5.3 Prequalification test for bolts and other types of anchors. This section is applicable when it is desired to use tension or shear values for anchors greater than those permitted by Table A1-E. The direct-tension test procedure set forth in Section A107.5.1 for existing anchors shall be used to determine the allowable tension values for new embedded through bolts, except that no preload is required. Bolts shall be installed in the same manner and using the same materials as will be used in the actual construction. A minimum of five tests for each bolt size and type shall be performed for each class of masonry in which they are proposed to be used. The allowable tension values for such anchors shall be the lesser of the average ultimate load divided by a factor of safety of 5.0 or the average load at which 1/8 inch (3.2 mm) elongation occurs for each size and type of bolt and class of masonry.

The test procedure for prequalification of shear bolts shall comply with ASTM E 488 or another approved procedure.

The allowable values determined in this manner shall be permitted to exceed those set forth in Table A1-E.

[B]A107.5.4 Reports. Results of all tests shall be reported. The report shall include the test results as related to anchor size and type, orientation of loading, details of the anchor installation and embedment, wall thickness, and joist orientation.

Add new standard to Chapter A6 as follows:

ASTM

E 488-10 Test Method for Strength of Anchors in Concrete and Masonry Elements

Reason: This proposal solves a problem caused by reference in the current provisions to an unavailable standard. Several sections and tables in Chapter A1 reference UBC Standard 21-7, but UBC Standards are no longer maintained and are not readily available. We know of no ICC-compliant standard for testing of existing and new wall anchors as needed by Appendix A1. Therefore, this proposal inserts the provisions from 1997 UBC Standard 21-7 in their entirety (with minor editorial changes) into a new Section A107.5.

The proposal also adds ASTM E 488 to IEBC Chapter A6. The 1990 edition of this standard was referenced in 1997 UBC Standard 21-7. This proposal updates that to the 2010 edition, as cited in proposed Section A107.5.3. A copy of the 2003 is being submitted separately for reference; the 2010 version is little-changed, and a copy will be provided prior to the hearings.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E488-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

EB16-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A105.3-EB-BONOWITZ.doc

EB17–12
[B] A106.2

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A106.2 Existing materials. Existing materials used as part of the required vertical load-carrying or lateral force-resisting system shall be in sound condition, or shall be repaired or removed and replaced with new materials. All other unreinforced masonry materials shall comply with the following requirements:

1. The lay-up of the masonry units shall comply with Section A106.3.2, and the quality of bond between the units has been verified to the satisfaction of the building official;
2. Concrete masonry units are verified to be load-bearing units complying with ~~UBC Standard 21-4~~ ASTM C90 or such other standard as is acceptable to the building official; and
3. The compressive strength of plain concrete walls shall be determined based on cores taken from each class of concrete wall. The location and number of tests shall be the same as those prescribed for tensile-splitting strength tests in Sections A106.3.3.3 and A106.3.3.4, or in Section A108.1.

The use of materials not specified herein or in Section A108.1 shall be based on substantiating research data or engineering judgment, with the approval of the building official.

Reason: This proposal solves a problem caused by reference in the current provisions to an unavailable standard. Current Section A106.2 references UBC Standard 21-4, but UBC Standards are no longer maintained and are not readily available. 1997 UBC Standard 21-4 was already based on ASTM Standard Specification C90-95 with respect to hollow load-bearing concrete block. The latest version of C90 provides the data needed to determine what Appendix A1 requires: the net mortared area of hollow concrete block and the thickness of face shells of nominal widths. The proposal therefore references ASTM C90 in place of UBC Standard 21-4.

ASTM C90 is not a new IEBC reference standard, as it is already referenced in IEBC Section A505.2.3.

Cost Impact: The code change proposal will not increase the cost of construction.

EB17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A106.2-EB-BONOWITZ.doc

EB18–12
[B] A106.3.2.1

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A106.3.2.1 Multiwythe solid brick. The facing and backing shall be bonded so that not less than 10 percent of the exposed face area is composed of solid headers extending not less than 4 inches (102 mm) into the backing. The clear distance between adjacent full length headers shall not exceed 24 inches (610 mm) vertically or horizontally. Where the backing consists of two or more wythes, the headers shall extend not less than 4 inches (102 mm) into the most distant wythe, or the backing wythes shall be bonded together with separate headers with their area and spacing conforming to the foregoing. Wythes of walls not bonded as described above shall be considered veneer. Veneer wythes shall not be included in the effective thickness used in calculating the height-to-thickness ratio and the shear capacity of the wall.

> **Exception:** <u>Where S_{D1} is not more than 0.3,</u> veneer wythes anchored as specified in the building code and made composite with backup masonry may be used for calculation of the effective thickness~~, where *SD1* exceeds 0.3~~.

Reason: This proposal corrects a mistake made when references to Seismic Zones were removed in the 2006 I-codes. In the 2003 IEBC, this exception read, “In other than Seismic Zone 4, or where S_{D1} exceeds 0.3*g*, veneer wythes anchored as specified in the Building Code and made composite with backup masonry may be used for calculation of the effective thickness.” The revision for 2006 intended to delete the reference Seismic Zone 4, but by striking only “In other than Seismic Zone 4,” it changed the meaning to suggest that veneer may be counted as part of the masonry *only* in regions of high seismicity, when just the opposite is intended. This proposal corrects the provision and restores the intended meaning.

Cost Impact: The code change proposal will not increase the cost of construction.

EB18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A106.3.2.1-EB-BONOWITZ.doc

EB19–12
[B]A104, [B]A106.3.3.1

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]SECTION A104
SYMBOLS AND NOTATIONS

For the purpose of this chapter, the following notations supplement the applicable symbols and notations in the building code.

V_{test} = Load at incipient cracking for each in-place shear test ~~per UBC Standard 21-6~~ performed in accordance with Section A106.3.3.1, pounds (kN).

(No change to notations not shown)

[B] A106.3.3.1 Mortar tests. The quality of mortar in all masonry walls shall be determined by performing in-place shear tests in accordance with the following:

1. The bed joints of the outer wythe of the masonry ~~should~~ shall be tested in shear by laterally displacing a single brick relative to the adjacent bricks in the same wythe. The head joint opposite the loaded end of the test brick ~~should~~ shall be carefully excavated and cleared. The brick adjacent to the loaded end of the test brick ~~should~~ shall be carefully removed by sawing or drilling and excavating to provide space for a hydraulic ram and steel loading blocks. Steel blocks, the size of the end of the brick, ~~should~~ shall be used on each end of the ram to distribute the load to the brick. The blocks ~~should~~ shall not contact the mortar joints. The load ~~should~~ shall be applied horizontally, in the plane of the wythe. The load recorded at first movement of the test brick as indicated by spalling of the face of the mortar bed joints is V_{test} in Equation A1-3.
2. Alternative procedures for testing shall be used where in-place testing is not practical because of crushing or other failure mode of the masonry unit (see Section A106.3.3.2).

Reason: This proposal is effectively editorial. It removes duplication and solves the problem caused by reference to an unavailable standard. UBC Standard 21-6 is no longer maintained and is not readily available. In any case, the information contained in UBC Standard 21-6 (a two-paragraph long standard) already appears verbatim in Section A106.3.3.1 item 1. The only differences are:

- Current A106.3.3.1 item 1 uses “should” in several places. The proposal changes these to “shall.”
- UBC Standard 21-6 describes briefly how to calculate the mortar strength from the test. The last sentence of current Section A106.3.3.1 item 1 already replaces that instruction with a more specific reference to Equation A1-3.

Cost Impact: This code change proposal will not increase the cost of construction.

EB19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A106.3.3.1-EB-BONOWITZ

EB20–12
[B]A103, [B]A106.3.3.9

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A106.3.3.9 Pointing. Deteriorated mortar joints in unreinforced masonry walls shall be pointed ~~according to UBC Standard 21-8.~~ <u>in accordance with the following requirements:</u>

1. <u>**Joint preparation.** The deteriorated mortar shall be cut out by means of a toothing chisel or nonimpact power tool to a depth at which sound mortar is reached but not less than 3/4-inch (19 mm). Care shall be taken not to damage the brick edges. After cutting is complete, all loose material shall be removed with a brush, air stream, or water stream.</u>
2. <u>**Mortar preparation.** The mortar mix shall be proportioned as required by the registered design professional. The pointing mortar shall be prehydrated by first thoroughly mixing all ingredients dry and then mixing again, adding only enough water to produce a damp workable mix which will retain its form when pressed into a ball. The mortar shall be kept in a damp condition for one and one-half hours; then sufficient water shall be added to bring it to a consistency that is somewhat drier than conventional masonry mortar.</u>
3. <u>**Packing.** The joint into which the mortar is to be packed shall be damp but without freestanding water. The mortar shall be tightly packed into the joint in layers not exceeding 1/4-inch (6.4 mm) in depth until it is filled; then it shall be tooled to a smooth surface to match the original profile.</u>

Nothing shall prevent pointing of any deteriorated masonry wall joints before ~~the tests are made~~ <u>testing in accordance with Section A106.3.3 is performed</u>, except as required in Section A107.1.

Revise as follows:

SECTION A103
DEFINITIONS

POINTING. ~~The partial reconstruction of the bed joints of an unreinforced masonry wall as defined in UBC Standard 21-8.~~ <u>The process of removal of deteriorated mortar from between masonry units and placement of new mortar. Also known as repointing or tuckpointing for purposes of this chapter.</u>

<u>**REPOINTING.** See Pointing.</u>

<u>**TUCKPOINTING.** See Pointing.</u>

Reason: This proposal solves a problem caused by reference in the current provisions to an unavailable standard. Current Section A106.3.3.9 references UBC Standard 21-8, but UBC Standards are no longer maintained and are not readily available. However, while various references exist, we know of no ICC-compliant standard for pointing. Therefore, this proposal inserts the relevant and necessary wording from UBC 21-8 (a short document less than a half-page long) into the provisions.

Specifically, the proposal:

- Clarifies that "pointing," the term used in this chapter, also means "repointing" or "Tuckpointing," terms used in some locales to mean the same thing. (For examples, see ASTM E2260-03, "Standard Guide for Repointing (Tuckpointing) Historic Masonry;" National Park Service Preservation Brief 2, "Repointing Mortar Joints in Historic Masonry Buildings;" and Brick

Industry Association Technical Note 46, “Maintenance of Brick Masonry.”). Note that despite the current text of section A103, UBC Standard 21-8 did not actually define pointing, so this definition is new, but consistent with that old standard.

- Adds the terms Repointing and Tuckpointing to the Definitions as a guide for those using other terms.
- Adds provisions describing the pointing process, using language taken directly from 1997 UBC Standard 21-8, with a few minor editorial changes. The only substantive change is the removal of a requirement in UBC Standard 21-8 for Type N or Type S pointing mortar. Selection of the mortar can be left to the registered design professional.
- Makes a more specific reference to the tests of interest with respect to pointing.

Cost Impact: This code change proposal will not increase the cost of construction.

EB20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A106.3.3.9-EB-BONOWITZ

EB21–12
[B]A108.2

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A108.2 Masonry shear strength. The unreinforced masonry shear strength, v_m, shall be determined for each masonry class from one of the following equations:

1. The unreinforced masonry shear strength, v_m, shall be determined by Equation A1-4 when the mortar shear strength has been determined by Section A106.3.3.1.

$$v_m = 0.56v_t + \frac{0.75P_D}{A} \quad \textbf{(Equation A1-4)}$$

The mortar shear strength values, v_t, shall be determined in accordance with Section A106.3.3.~~5 and shall not exceed 100 pounds per square inch (689.5 kPa) for the determination of~~ ~~v_m~~.

(Portions of text not shown remain unchanged)

Reason: There is no technical justification for limiting mortar shear strength values to an arbitrary value of 100 psi. While many structures have mortar strengths less than 100 psi, many other structures have mortar strengths greater than 100 psi. There is no need for extra conservatism for stronger, better built, or more robust structures.

Cost Impact: The code change proposal will not increase the cost of construction.

EB21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A108.2-EB-SEARER.doc

EB22–12
[B]A206.6

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**[B]A206.6 Minimum member size.** Wood members used to develop anchorage forces to the diaphragm must be at least 3-inch (76 mm) nominal members for new construction and replacement. All such members must be checked for gravity and earthquake loading as part of the wall-anchorage system.~~

> ~~**Exception:** Existing 2-inch (51 mm) nominal members may be doubled and internailed to meet the strength requirement.~~

Reason: Minimum member size is no longer a requirement of the code for new construction. It is more rational to determine member size by calculation than by arbitrary limits, so smaller members should be acceptable if justified by calculation.

Cost Impact: This code change proposal will not increase the cost of construction.

EB22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A206.6-EB-BONOWITZ

EB23–12
[B] A301.3

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A301.3 Alternative design procedures. The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used where designed by a registered design professional ~~and~~ or approved by the *code official*. Approval of alternatives shall be based on a demonstration that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

Where analysis by a registered design professional is required, such analysis shall be in accordance with all requirements of the building code, except that the seismic forces may be taken as 75 percent of those specified in the building code.

Reason: This proposal provides flexibility to local jurisdictions to use alternative prescriptive solutions without the need for engineered solutions. This is consistent with the intent of the chapter and represents a practice already successfully in place in Berkeley and other California jurisdictions. Since the final sentence of the section already requires a demonstration of equivalence, code official approval is sufficient and there should be no need for both special approval *and* engineered design.

Cost Impact: The code change proposal will not increase the cost of construction.

EB23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A301.3-EB-BONOWITZ.doc

EB24–12
[B] A302

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SECTION A302
DEFINITIONS

For the purpose of this chapter, in addition to the applicable definitions in the building code, certain additional terms are defined as follows:

[B] ADHESIVE ANCHOR. An assembly consisting of a threaded rod, washer, nut, and chemical adhesive approved by the *code official* for installation in existing concrete or masonry.
~~**[B] COMPOSITE PANEL.** A wood structural panel product composed of a combination of wood veneer and wood-based material, and bonded with waterproof adhesive.~~
[B] CRIPPLE WALL. A wood-frame stud wall extending from the top of the foundation to the underside of the lowest floor framing.
[B] EXPANSION ANCHOR. An approved post-installed anchor, inserted into a pre-drilled hole in existing concrete or masonry, that transfers loads to or from the concrete or masonry by direct bearing or friction or both.
~~**[B] ORIENTED STRAND BOARD (OSB).** A mat-formed wood structural panel product composed of thin rectangular wood strands or wafers arranged in oriented layers and bonded with waterproof adhesive.~~
[B] PERIMETER FOUNDATION. A foundation system that is located under the exterior walls of a building.
~~**[B] PLYWOOD.** A wood structural panel product composed of sheets of wood veneer bonded together with the grain of adjacent layers oriented at right angles to one another.~~
[B] SNUG-TIGHT. As tight as an individual can torque a nut on a bolt by hand, using a wrench with a 10-inch-long (254 mm) handle, and the point at which the full surface of the plate washer is contacting the wood member and slightly indenting the wood surface.
~~**[B] WAFERBOARD.** A mat-formed wood structural panel product composed of thin rectangular wood wafers arranged in random layers and bonded with waterproof adhesive.~~
~~**[B] WOOD STRUCTURAL PANEL.** A structural panel product composed primarily of wood and meeting the requirements of United States Voluntary Product Standard PS 1 and United States Voluntary Product Standard PS 2. Wood structural panels include all-veneer plywood, composite panels containing a combination of veneer and wood-based material, and mat-formed panels such as oriented strand board and waferboard.~~

<u>**WOOD STRUCTURAL PANEL.** A panel manufactured from veneers, wood strands or wafers or a combination of veneer and wood strands or wafers bonded together with waterproof synthetic resins or other suitable bonding systems. Examples of wood structural panels are:</u>
<u>**Composite panels.** A wood structural panel that is comprised of wood veneer and reconstituted wood-based material and bonded together with waterproof adhesive;</u>
<u>**Oriented strand board (OSB).** A mat-formed wood structural panel comprised of thin rectangular wood strands arranged in cross-aligned layers with surface layers normally arranged in the long panel direction and bonded with waterproof adhesive; or</u>
<u>**Plywood**. A wood structural panel comprised of plies of wood veneer arranged in cross-aligned layers. The plies are bonded with waterproof adhesive that cures on application of heat and pressure.</u>

Reason: This proposal updates Chapter A3 and provides consistency of definitions between the IEBC and the IBC. The proposal replaces definitions in current IEBC Chapter A3 with the definition of Wood Structural Panel (and the three example types) verbatim from 2012 IBC Chapter 2.

In addition, the definition of Waferboard is proposed to be deleted, as waferboard is no longer used for this application or widely produced.

Cost Impact: The code change proposal will not increase the cost of construction.

EB24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A302-EB-BONOWITZ.doc

EB25–12
[B] A303.1

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A303.1 General. For the purposes of this chapter, any of the following conditions shall be deemed a structural weakness: ~~structural weaknesses shall be as specified below.~~

1. Sill plates or floor framing that are supported directly on the ground without a foundation system that conforms to the building code.

(Portions of text not shown remains unchanged)

Reason: This proposal is an editorial improvement and clarification.

Cost Impact: The code change will not increase the cost of construction.

EB25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A303.1-EB-BONOWITZ

EB26–12

[B] A304.2.6, Chapter A6 (NEW)

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A304.2.6 New sill plates. Where new sill plates are used in conjunction with new foundations, they shall be minimum 2x nominal thickness and shall be preservative-treated wood or naturally durable wood permitted by the building code for similar applications, and shall be marked or branded by an approved agency. ~~Nails~~ Fasteners in contact with preservative-treated wood shall be hot-dip galvanized or other material permitted by the building code for similar applications. Fasteners, whether cast-in-place or post-installed, that anchor a preservative-treated sill plate to the foundation shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Metal framing anchors in contact with preservative treated wood shall be galvanized in accordance with ASTM A 653 with a G 185 coating.

Add new standard to Chapter A6 as follows:

ASTM

B695-04 Standard Specification for Coating of Zinc Mechanically Deposited on Iron and Steel

Reason: This proposal makes two improvements related to metal hardware in contact with treated wood:

- In the second sentence, it replaces “nails” with “fasteners” to clarify that the provision is general.
- It inserts a sentence addressing allowable compliance for anchor bolts. The compliance details match those in 2012 IBC Section 2304.9.5.3.

Since ASTM B 695 is not yet used in the IEBC, the proposal adds it to Chapter A6. However, B 695 is already used in the IBC, so a copy is not provided with the proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

EB26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A304.2.6-EB-BONOWITZ.doc

EB27–12
[B] A304.3.1, [B] A304.3.2, [B] Table A3-A, [B] Table A3-B, [B]Figure A3-3

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A304.3.1 Existing perimeter foundations. Where the building has an existing continuous perimeter foundation, all perimeter wall sill plates shall be anchored to the foundation with adhesive anchors or expansion anchors in accordance with Table A3-A. Anchors shall be installed in accordance with Figure A3-3, with the plate washer installed between the nut and the sill plate. The nut shall be tightened to a snug-tight condition after curing is complete for adhesive anchors and after expansion wedge engagement for expansion anchors.

All anchors shall be installed in accordance with manufacturer's recommendations. Where existing conditions prevent anchor installations through the sill plate, this connection ~~may~~ shall be made in accordance with Figure A3-4A, A3-4B, or A3-4C. The spacing of these alternate connections shall comply with the maximum spacing requirements of Table A3-A. Expansion anchors shall not be used where the installation causes surface cracking of the foundation wall at the locations of the ~~bolt~~ anchor.

[B] A304.3.2 Placement of anchors. Anchors shall be placed within 12 inches (305 mm), but not less than 9 inches (229 mm), from the ends of sill plates and shall be placed in the center of the stud space closest to the required spacing. New sill plates may be installed in pieces where necessary because of existing conditions. For lengths of sill plates ~~greater than 12 feet (3658 mm)~~ 12 feet (3658 mm) or greater, anchors ~~or bolts~~ shall be spaced along the sill plate as specified in Table A3-A. For other lengths of sill plate, anchor placement shall be in accordance with Table A3-B.

> **Exception:** Where physical obstructions such as fireplaces, plumbing or heating ducts interfere with the placement of an anchor, the anchor shall be placed as close to the obstruction as possible, but not less than 9 inches (229 mm) from the end of the plate. Center-to-center spacing of the anchors shall be reduced as necessary to provide the minimum total number of anchors required based on the full length of the wall. Center-to-center spacing shall not be less than 12 inches (305 mm).

[B] TABLE A3-A
SILL PLATE ANCHORAGE AND CRIPPLE WALL BRACING

a. Sill plate anchors shall be ~~chemical~~ adhesive anchors or expansion ~~bolts~~ anchors in accordance with Section A304.3.1.

(Portions of Table not shown remain unchanged)

[B] TABLE A3-B
SILL PLATE ANCHORAGE FOR VARIOUS LENGTHS OF SILL PLATE[a,b]

a. Connections shall be either ~~chemical~~ adhesive anchors or expansion ~~bolts~~ anchors

(Portions of Table not shown remain unchanged)

[B] FIGURE A3-3
SILL PLATE ~~BOLTING~~ ANCHORING TO EXISTING FOUNDATION

(No change to figure)

Reason: The proposal makes terminology changes for consistency. The proposed wording change to Section A304.3.2 provides consistency with current Table A3-B.

Cost Impact: The code change proposal will not increase the cost of construction.

EB27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A304.3.1-EB-BONOWITZ.doc

EB28–12
[B] A304.4.1.1

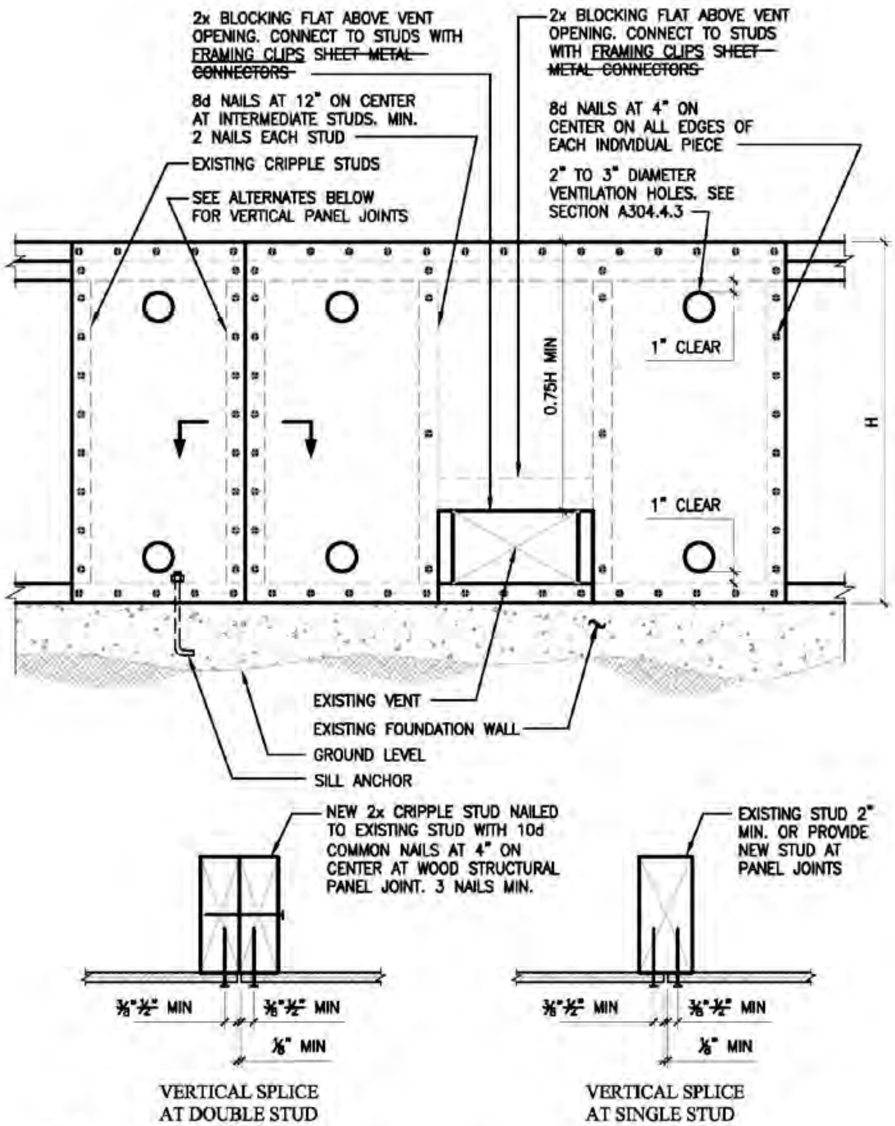
Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A304.4.1.1 Sheathing installation requirements. Wood structural panel sheathing shall not be less than $^{15}/_{32}$-inch (12 mm) thick and shall be installed in accordance with Figure A3-5 or A3-6. All individual pieces of wood structural panels shall be nailed with 8d common nails spaced 4 inches (102 mm) on center at all edges and 12 inches (305 mm) on center at each intermediate support with not less than two nails for each stud. Nails shall be driven so that their heads are flush with the surface of the sheathing and shall penetrate the supporting member a minimum of $1^{1}/_{2}$ inches (38 mm). When a nail fractures the surface, it shall be left in place and not counted as part of the required nailing. A new 8d nail shall be located within 2 inches (51 mm) of the discounted nail and be hand-driven flush with the sheathing surface. Where the installation involves horizontal joints, those joints shall occur over nominal 2-inch by 4-inch (51 mm by 102 mm) blocking installed with the nominal 4-inch (102 mm) dimension against the face of the plywood.

Vertical joints at adjoining pieces of wood structural panels shall be centered on studs such that there is a minimum 1/8 inch (3.2 mm) between the panels. ~~, and such that the nails are placed a minimum of ½ inch (12.7 mm) from the edges of the existing stud.~~ Where ~~such~~ required edge distances cannot be maintained because of the width of the existing stud, a new stud shall be added adjacent to the existing studs and connected in accordance with Figure A3-7.



FOR SI: 1 INCH = 25.4mm

FIGURE A3-7 – PARTIAL CRIPPLE STUD WALL ELEVATION

Reason: This proposal revises the edge distance requirement to avoid a potential problem nailing into narrow existing studs. The current requirement, shown in Figure A3-7, puts the nail 1/2 inch from the plywood edge; with a 2x stud, this leaves too little edge distance into the stud. A 3/8 inch edge distance in the plywood is considered adequate for this application.

In addition to changing the edge distance in Figure A3-7, the proposal makes the following improvements:

- Removes the duplicative edge distance requirement from Section A304.4.1.1, deferring to Figure A3-7.
- Revises wording in Figure A3-7, from “sheet metal connectors” to “framing clips” for consistency.
- Defines the height of the cripple wall, H, in Figure A3-7.

Cost Impact: The code change proposal will not increase the cost of construction.

EB28-12

Public Hearing: Committee: AS AM D

EB29–12
[B]A403.5

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]A403.5. Deformation Compatibility and PΔ effects. The requirements of the building code shall apply, except as modified herein. All structural framing elements and their connections not required by design to be part of the lateral force-resisting system shall be designed and/or detailed to be adequate to maintain support of ~~design dead plus live~~ expected gravity loads when subjected to the expected deformations caused by seismic forces. ~~The stress analysis of cantilever columns shall use a buckling factor of 2.1 for the direction normal to the axis of the beam.~~ Increased demand due to PΔ effects and story sidesway stability shall be considered in retrofit stories that rely on the strength and stiffness of cantilever columns for lateral resistance.

Reason:
The proposal makes a number of revisions related to the performance of gravity load-carrying columns subjected to lateral deformations within the retrofitted story:

- The title of the section is changed to reflect its actual concerns, which are greater than just P-delta effects.
- "Design dead plus live" loads represent an over-conservative requirement for existing elements that are not part of the lateral system, so only "expected gravity" are required.
- The current sentence about "stress analysis of cantilever columns" is unclear as to whether it is concerned with columns that are part of the lateral system (which would likely be columns added as part of the retrofit) or existing columns carrying only gravity loads. The proposed revision handles both situations:
  - For existing gravity columns, the current sentence is unnecessary. The first two sentences establish the general requirements. A specific effective length factor need not be given here, especially since it might be over-conservative for the actual condition.
  - For columns that do resist lateral loads, the proposed new sentence clarifies that increased demands must be considered. Specific criteria are, appropriately, left to the engineer of record, subject to the general requirements in the first part of the section.

Cost Impact: This code change proposal will not increase the cost of construction.

EB29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A403.5-EB-BONOWITZ

EB30–12
[B]A403.8

Proponent: Gary Searer, Wis, Janney, Elstner Associates, Inc, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]A403.8: Horizontal diaphragms. The strength of an existing horizontal diaphragm sheathed with wood structural panels or diagonal sheathing need not be investigated~~ unless the diaphragm is required to transfer lateral forces from vertical elements of the seismic-force-resisting system above the diaphragm to elements below the diaphragm because of an offset in placement of the elements~~.

~~Wood diaphragms with stories above shall not be allowed to transmit lateral forces by rotation or cantilever except as allowed by the building code; however, r~~ <u>R</u>otational effects shall be accounted for when <u>asymmetric</u> ~~unsymmetric~~ wall stiffness increases shear demands.

> ~~**Exception:** Diaphragms that cantilever 25 percent or less of the distance between lines of lateral-load-resisting elements from which the diaphragm cantilevers may transmit their shears by cantilever, provided that rotational effects on shear walls parallel and perpendicular to the load are taken into account.~~

Reason: None of these requirements is particularly clear, and none of these requirements is required or assists the engineer in understanding how the SWOF structure will behave. Specifically, by definition, all SWOF structures already use the diaphragm to transfer lateral forces (including by rotation or cantilever), but the intent of the deleted portions was not to trigger investigation of the floor diaphragm; indeed, no soft/weak/open front wood-framed structures have ever been identified where a structural wood panel diaphragm or diagonally sheathed diaphragm failed, resulting in a collapse in a prior earthquake (where the current, unclear requirement would have "caught" and prevented the failure.

"Unsymmetric" is not a word.

The exception is so unclear as to be useless (Is it an exception to the first paragraph of this section, the second paragraph, or both?), and even has the potential to make proper strengthening more difficult or less economical than required. For example, consider a 90-foot long by 25-foot wide structure, with a solid back wall and two end transverse walls. Assuming that this poorly worded exception is intended to take the distance between transverse walls times 25 percent (25 percent of 90 feet is 22.5 feet), this structure would not be allowed without adding strength and stiffness along the open front, although there is nothing wrong with having a robust lateral force resisting system that consists of the back wall and the two end transverse walls. If one then adds interior transverse walls at the third points, then the maximum cantilever counterintuitively drops to 25 percent of 30 feet or 7.5 feet, and you would <u>still</u> have to add strength and stiffness along the open front. Conversely, if the structure were 110 feet long by 25 feet wide, the structure would qualify for this exception <u>unless</u> the designer tried to add interior transverse walls at the third points -- at which point, the exception "blows up" and the structure would require greater intervention -- again a counterintuitive result. Finally, rotational effects are already taken into account in the second paragraph, so how this is an exception is unclear.

Cost Impact: This code change proposal will not increase the cost of construction.

EB30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A403.8-EB-SEARER

EB31–12
[B]A404.2.4

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]A404.2.4 Shear wall hold-downs. Shear walls shall be provided with hold-down anchors at each end. Two hold-down anchors are required at intersecting corners. Hold-downs shall be approved connectors with a minimum ⅝-inch-diameter (15.9 mm) threaded rod or other approved anchor with a minimum allowable load of 4,000 pounds (17.8 kN). Anchor embedment in concrete shall not be less than 5 inches (127 mm). Tie-rod systems shall not be less than ⅝ inch (15.9 mm) in diameter unless using high strength cable. ~~Threaded rod or high~~ High strength cable elongation shall not exceed 5/8 inch (15.9 mm) ~~using design forces~~ under a 4,000 pound (17.8 kN) axial load.

Reason: This proposal clarifies the current requirement, acknowledging that Section A404 is a prescriptive approach, so there are no "design forces" to be applied. Instead, the required allowable strength from earlier in the section is used to gauge the cable axial stiffness. This is consistent with the 2009 IEBC commentary. Threaded rods are excluded from the elongation requirement because they have a minimum diameter given in the previous sentence (and because a 5/8" steel rod would easily meet the deflection limit).

Cost Impact: This code change proposal will not increase the cost of construction.

EB31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A405.2.4-EB-BONOWITZ

EB32–12
[B]A404.2.4

Proponent: Marko Schotanus, Chair, Existing Buildings Committee, Structural Engineers Association of California (MSchotanus@ruthchek.com)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]A404.2.4 Shear wall hold-downs. Shear walls shall be provided with hold-down anchors at each end. Two hold-down anchors are required at intersecting corners. Hold-downs shall be approved connectors with a minimum ⅝-inch-diameter (15.9 mm) threaded rod or other approved anchor with a minimum allowable load of 4,000 pounds (17.8 kN). Anchor embedment in concrete shall not be less than 5 inches (127 mm). Tie-rod systems shall not be less than ⅝ inch (15.9 mm) in diameter unless using high strength cable. ~~Threaded rod or high strength cable elongation shall not exceed 5/8 inch (15.9 mm) using design forces.~~

Reason: This proposal removes the unnecessary final sentence regarding hold-down stiffness. First, the current provision is impossible to implement because Section A405 is a prescriptive approach with no "design forces" and because the provision does not specify a length over which to measure or calculate the elongation. Second, if the 4000 pound allowable load from earlier in the provision is used to gauge the stiffness, the minimum diameter 5/8 inch rod would have to be over 100 ft long to see a 5/8 inch elongation. Typical cable systems, while less stiff than rods, are adequate as well. Finally, the 5/8 inch elongation limit means little in terms of performance, because different shear wall lengths and story heights will experience different drifts for the same hold down elongation.

Cost Impact: This code change proposal will not increase the cost of construction.

EB32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A405.2.4-EB-SCHOTANUS

EB33–12
[B]A503.2

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[A]A503.2 Properties of cast-in-place materials. Except where specifically permitted herein, the stress-strain relationship of concrete and reinforcement shall be determined from published data or by testing. All available information, including building plans, original calculations and design criteria, site observations, testing and records of typical materials and construction practices prevalent at the time of construction, shall be considered when determining material properties. For Tier 3 analysis, nominal and expected material properties shall be established in accordance with Section 6.2 of ASCE 41. ~~be used in lieu of nominal properties in the calculation of strength, stiffness and deformability of building omponents.~~ ~~The procedure for testing and determination of material properties shall be from Section 6.2 of ASCE 41-06.~~

Reason: This proposal intends to update a reference standard and makes appropriate corresponding revisions. ASCE 41-06 Supplement No. 1 has been available to and in use by engineers for several years. It is available online, free, at http://content.seinstitute.org/publications/ASCE41supplement.html. A pdf version is being submitted with this proposal.

Supplement No. 1 modified the ASCE 41 modeling parameters and acceptance criteria for concrete elements of interest in IEBC Chapter A5. The modifications reflect recent testing and represent more rational and appropriately less conservative criteria than were in ASCE 41 previously. They should be used. The current criteria of Chapter A5 use expected material properties as a way of compensating for the previous conservatism of ASCE 41. Now that Supplement No. 1 is available, that compensation is no longer needed, and ASCE 41, with Supplement No. 1, may be referenced directly, as proposed.

Cost Impact: This code change proposal does not increase the cost of construction.

Analysis: This change proposal references ASCE standard 41, which is already referenced in this code. However, the proposed change to code text is written to correlate with supplement 1 of the 2006 edition of the standard rather than the simply the 2006 edition presently referenced in the code. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved by the Administrative Code Committee, the code text will revert to the text as it appears in the 2012 edition of the code.

EB33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A503.2-EB-BONOWITZ

EB34–12
[B] A503.2, [B] A504.1, [B] A505.1, [B]A506.3.2, [B] A507.1, [B]Chapter A6

Proponent: Jennifer Goupil, The Structural Engineering Institute of ASCE (jgoupil@asce.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A503.2 Properties of cast-in-place materials.
Except where specifically permitted herein, the stress-strain relationship of concrete and reinforcement shall be determined from published data or by testing. All available information, including building plans, original calculations and design criteria, site observations, testing and records of typical materials and construction practices prevalent at the time of construction, shall be considered when determining material properties.

For Tier 3 analysis, expected material properties shall be used in lieu of nominal properties in the calculation of strength, stiffness and deformabiltity of building components.

The procedure for testing and determination of material properties shall be from ASCE 41 Section 10.2. ~~6.2 of ASCE 41-06.~~

[B] A504.1 Site ground motion for Tier 1 analysis.
The earthquake loading used for the determination of demand on elements of the structure shall correspond to that required by ASCE 41 Chapter 4.~~ASCE 31 Tier 1~~.

[B] A505.1 General.
Structures conforming to the requirements of the ASCE 41 Chapter 4~~31~~ Tier 1, Screening Phase, are permitted to be shown to be in conformance to this chapter by submission of a report to the building official as described in this section.

[B] A506.3.2 Component stiffness.
Component stiffness shall be calculated based on the approximate values shown in ASCE 41 Table 10-5 ~~6-5 of ASCE 41~~.

[B] A507.1 General.
A Tier 3 evaluation shall be performed using the nonlinear procedures of ASCE 41 Section 10.3.1.2.2 ~~6.3.1.2.2. of ASCE 41~~. The general assumptions and requirements of ASCE 41 Section 10.3 ~~Section 6.0~~, excluding concrete frames with in-fills shall be used in the evaluation. Site-ground motions in accordance with Section A504.3 are permitted for this evaluation.

Reason: The purpose of this proposal is update Appendix A5 to the recently updated ASCE 41-13, which is a combination of the two standards referenced in the 2012 IEBC (ASCE 31-03 and 41-06). The updated and combined standard follows the same three-tiered approach ASCE 31/41 so this proposal is simply an update of section references. The concrete provisions of ASCE 41-13 Chapter 4 (Tier 1 in A5) and Chapter 10 (Tier 3 in A5) have been updated based on recent research and also incorporate provisions adopted by the ACI 369 Committee as representative of the state of the practice for the seismic evaluation and retrofit of existing concrete buildings.

A public ballot version of the new standard will be available from ASCE in the spring of 2012 and it is expected that it a prepublication (white cover) version will be available prior to the ICC Final Action Hearings in October of 2012. Any person interested in obtaining a public comment copy of ASCE 41-13 may do so by contacting the proponent at jgoupil@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This change proposal references ASCE standard 41, which is already referenced in this code. However, the proposed change to code text is written to correlate with a new edition of this standard ASCE 41-13, rather than the edition presently referenced in the code, which is the 2006 edition. The 2013 edition of this standard is not yet completed, published and available.

The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved by the Administrative Code Committee, the code text will revert to the text as it appears in the 2012 edition of the code. Additionally, if the standard update is approved but the document is not published and available by December 1, 2014, an errata will be issued to the code that will return the affected code text to the text as it appears in the 2012 edition of the code.

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EB34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A503.2-EB-GOUPIL

EB35–12
[B]A507.1

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]A507.1 General. A Tier 3 evaluation shall be performed using the ~~nonlinear procedures~~ Nonlinear Static Procedure or Nonlinear Dynamic Procedure of Section ~~6.3.1.2.2~~ 3 of ASCE 41. The general assumptions and requirements of Sections 2.0, 3.0 and 6.0, excluding those for concrete frames with ~~in-fills~~ infills, shall be used in the evaluation. Reduced IBC level ~~Site~~ site-ground motions in accordance with Section A504.3 are permitted for this evaluation. Structures meeting the ASCE 41 Life Safety (LS) acceptance criteria shall be deemed to comply with this chapter. If a Tier 3 analysis identifies nonconforming conditions, such conditions shall be modified to conform to the acceptance criteria.

Reason: This proposal corrects and revises Chapter A5's references to ASCE 41. The proposed references to ASCE 41 Sections 2.0, 3.0, and 6.0, as opposed to just Section 6.0, give a more complete understanding of the various ASCE 41 provisions that Chapter A5 expects to be followed.

The proposed added sentence at the end of the section clarifies the Performance Level to be used with ASCE 41 in order to match the general intent of Chapter A5. This was always the intent of this section; it had just not been stated clearly before.

Cost Impact: This code changed proposal will not increase the cost of construction.

EB35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

A507.1-EB-BONOWITZ

EB36–12
[B]C101.1, [B]C101.2, [B]C101.3 (New)

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

~~**[B]C101.1 Intent and purpose.** The provisions of this chapter provide prescriptive methods for selected structural retrofitting of existing buildings to increase their resistance to wind loads. Except as provided herein, other structural provisions of the *International Building Code* or the *International Residential Code* shall apply, as required.~~

~~**[B]C101.2 Scope.** The following prescriptive methods are intended for applications where the gable end wall framing is provided by a metal-plate-connected gable end frame or a conventionally framed gable end. The retrofits are appropriate for wall studs or webs spaced 24 inches (610 mm) on center maximum and oriented with the wide face either parallel or perpendicular to the surface of the gable end. Gable ends to be strengthened shall be permitted to be retrofitted using methods prescribed by this chapter.~~

[B]C101.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to out-of-plane wind loads. It is intended for voluntary use and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

[B]C101.2 Eligible buildings and gable end walls. The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:

1. The building is not more than three stories tall, from adjacent grade to the bottom plate of each gable end wall being retrofitted with this chapter.
2. The building is classified as Occupancy Group R3 (1-2 family dwellings)
3. The structure includes one or more wood-framed gable end walls, either conventionally framed or metal-plate-connected.

In addition, the provisions of this chapter are applicable only to gable end walls that meet the following eligibility requirements:

4. Each gable end wall has or shall be provided with studs or vertical webs spaced 24 inches (610 mm) on center maximum.
5. Each gable end wall has a maximum height of 16 ft.

[B]C101.3 Compliance. Eligible gable end walls in eligible buildings may be retrofitted with this chapter. Eligible buildings with one or more ineligible gable end walls may be retrofitted with this chapter, provided all ineligible gable end walls are retrofitted with alternative criteria approved by the building official as equivalent. All other modifications required for conformance with this chapter shall be designed and constructed in accordance with the *International Building Code* or *International Residential Code* provisions for new construction except as specifically provided for by this chapter.

Reason: This proposal reorganizes, clarifies, and supplements the Chapter's provisions regarding intent, scope, eligibility, and compliance.

Proposed section C101.1 restates the first sentence of current section C101.1 and adds two clarifying sentences that confirm the relationship of this chapter to the rest of the IEBC and to other I-codes (similar to the current text of Section C201.1). Chapter C1 was added to the 2012 IEBC as a good idea suitable for voluntary use but not benchmarked in terms of performance. Because other IEBC provisions at times call for structural evaluation or retrofit to resist wind loads, it is important to be clear that Chapter C1 does not necessarily satisfy those requirements.

Proposed section C101.2 lays out the eligibility requirements in a more direct and specific way:

- Item 1: The proposed three-story limit is new, but it reflects our understanding (based on review of the supporting calculations and Chapter history) of the intent of Chapter C1 to apply to typical 1-2 unit dwellings of conventional wood framing. Given the limits of the Chapter's supporting studies and past applications, it would be wrong to encourage this retrofit scheme for taller or more complex structures that happen to have wood framed gable end walls.
- Item 2: The proposed occupancy eligibility rule is new, but it again reflects our understanding of the intent of Chapter 1 to apply to typical 1-2 unit dwellings. Given the limits of the Chapter's supporting studies, past applications, and lack of benchmarking by risk category, it would be wrong to encourage this retrofit scheme for multi-unit complexes or for assisted living, commercial, educational, or other occupancies simply because the building looks like a house. (For ease of use by homeowners and residential contractors, we have proposed this eligibility limit in terns of occupancy. Alternatively, because the governing load is extreme wind, eligibility could be written in terms of risk category with reference to IBC Table 1604.5.)
- Item 3: This is a simple provision that merely confirms the presence of the structural elements of interest.
- Item 4: The 24 inch spacing requirement matches the current provision in C101.2. The proposed rule adds an allowance that a non-conforming structure may be made to conform through the retrofit.
- Item 5: The 16 ft height limit comes from current Table C104.2. It is useful to have such eligibility rules in one place near the top of the chapter.

Proposed section C101.3 implements the eligibility rules of proposed section C101.2 and explicitly addresses the case of buildings where some gable end walls are eligible and others are not. The final sentence restates the provision from current section C101.1, but in an appropriate place. The text is borrowed from IEBC A403.1, which has the same intent.

In summary, the proposal is measured and fair, and it respects the intention of the Chapter and its proponents. We have limited the proposal to basic issues, leaving aside remaining questions regarding, for example, maximum spans, suitable roof sheathing, suitable ceiling construction, and suitable exterior wall sheathing or siding.

Cost Impact: This code change proposal will not increase the cost of construction.

EB36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

C101.1-EB-BONOWITZ

EB37–12
[B]C201.1, [B]C201.2

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

~~**[B]C201.1 Intent and purpose.** The provisions of this chapter provide prescriptive methods for selected structural retrofitting of existing buildings. Compliance with these provisions will not always meet the requirements for new construction in the *International Building Code* or the *International Residential Code*. The provisions of this chapter are intended to provide methods for strengthening existing buildings to increase resistance to wind loads.~~

~~**[B]C201.2 Scope.** The provisions of this chapter are a prescriptive alternative for one- and two-family dwellings located where the wind speed according to Section 1609 of the *International Building Code* exceeds 100 mph (44.7 m/s) to achieve compliance with Section 706.3 of the *International Existing Building Code*.~~

[B]C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to wind loads. It is intended for voluntary use and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

[B]C201.2 Eligible conditions. The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:
1. Buildings assigned to risk category I or II per *International Building Code* Table 1604.5.

Reason: This proposal clarifies and corrects the Chapter's provisions regarding intent, scope, and eligibility.

Proposed section C201.1 restates current section C201.1 and adds a clarifying sentence that confirms the relationship of this chapter to the rest of the IEBC and to other I-codes. Chapter C2 was added to the 2012 IEBC as a good idea suitable for voluntary use but not benchmarked in terms of performance. Because other IEBC provisions at times call for structural evaluation or retrofit to resist wind loads, it is important to be clear that Chapter C2 does not necessarily satisfy those requirements. In particular, the statement in current section C201.2 regarding compliance with Section 706.3 is for that reason proposed for deletion.

Proposed section C201.2 expands the current reference to "one- and two-family dwellings." Since nothing in Chapter C2 presumes a building use or a construction type specific to R3 occupancy, the Chapter actually has broader applicability than is currently stated. The appropriate limit is to risk category I and II buildings, as proposed. Also, there is no need to state a minimum wind speed in the provision; if the criteria are good for wind speeds over 100 mph, they are also good for lower demands.

Cost Impact: This code change proposal will not increase the cost of construction.

EB37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

C201.1-EB-BONOWITZ

EB38–12
[B] C201.2, [B] Table C202.1.2

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] C201.2 Scope. The provisions of this chapter are a prescriptive alternative for one- and two-family dwellings located where the ultimate design wind speed V_{ult}, determined in accordance with Figure 1609A ~~according to Section 1609~~ of the *International Building Code* exceeds 130 mph (58 m/s) ~~100 mph (44.7 m/s)~~ to achieve compliance with Section 706.3 of the *International Existing Building Code*.

[B] TABLE C202.1.2
SUPPLEMENTAL FASTENERS AT PANEL EDGES AND INTERMEDIATE FRAMING

EXISTING FASTENERS	EXISTING FASTENER SPACING (EDGE OR INTERMEDIATE SUPPORTS)	MAXIMUM SUPPLEMENTAL FASTENER SPACING FOR ~~WIND SPEEDS GREATER THAN 100 MPH~~ 130 MPH < V_{ULT} ≤ 140 MPH	MAXIMUM SUPPLEMENTAL FASTENER SPACING FOR INTERIOR ZONE[c] LOCATIONS FOR ~~WIND SPEEDS EXCEEDING~~ V_{ULT} > 140 MPH ~~110 MPH~~ AND EDGE ZONES NOT COVERED BY THE COLUMN TO THE RIGHT	EDGE ZONE[d] FOR ~~WIND SPEED GREATER THAN~~ V_{ULT} > 160 MPH ~~120 MPH~~ AND EXPOSURE C, OR ~~WIND SPEED GREATER THAN~~ V_{ULT} > 180 MPH ~~140 MPH~~ AND EXPOSURE B

(Portions of table not shown remain unchanged)

Reason: The purpose of this proposal is to correlate basic wind speed triggers in the IEBC with the IBC. The 2012 IBC adopted new ultimate-strength basis wind speed maps from ASCE 7-10. A conversion factor from the ultimate wind speed selected from the new maps (V_{ult}) down to the old allowable-stress level wind speed (V_{asd}) was introduced into the IBC to accommodate triggers for special requirements in high-wind regions, tables limiting the use of ballasted roofs at certain heights and wind speeds, and tables for proper selection of shingles and other roofing materials for wind resistance. Unfortunately, this conversion was not introduced into the IEBC, with the result that provisions which were supposed to apply only in high-wind regions now appear to apply across the entire United States. This proposal not only corrects this oversight, it fully updates the IEBC provisions to match the 2012 IBC and ASCE 7-10.

Cost Impact: The code change proposal will not increase the cost of construction.

EB38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

C201.2-EB-EHRLICH

EB39–12

[B] Figure A3-1, [B] Figure A3-2

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] FIGURE A3-1
NEW REINFORCED CONCRETE FOUNDATION SYSTEM

a. Where frost conditions occur, the minimum depth shall extend below the frost line.
b. The ground surface along the interior side of the foundation may be excavated to the elevation of the top of the footing.
c. ~~When expansive soil is encountered~~ Where the code official has designated the soil as expansive, the foundation depth and reinforcement shall be ~~as directed~~ approved by the ~~building~~ code official.

(Portions of figure not shown remain unchanged)

[B] FIGURE A3-2
NEW MASONRY CONCRETE FOUNDATION

a. Where frost conditions occur, the minimum depth shall extend below the frost line.
b. The ground surface along the interior side of the foundation may be excavated to the elevation of the top of the footing.
c. ~~When expansive soil is encountered~~ Where the code official has designated the soil as expansive, the foundation depth and reinforcement shall be ~~as directed~~ approved by the ~~building~~ code official.

(Portions of figure not shown remain unchanged)

Reason: This proposal clarifies the intended applicability and alternative criteria for expansive soil conditions. The intent of these notes is simply that the default, tabulated values might not be appropriate for highly expansive soil. Since most building departments are aware of local expansive soil conditions (and might even have their own prescriptive pre-approved details), the intent is to call attention to those known cases. Thus, the current wording about “when expansive soil is encountered” gives the wrong impression. Instead, since this chapter presumes no engineered design, there should be no burden on the builder to know or discover the soil conditions. Rather, the burden should merely be to check if the code official has made a designation, and if so, to get appropriate plan check approval for the footing details.

Cost Impact: This code change proposal will not increase the cost of construction.

EB39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

F A3-1-EB-BONOWITZ

EB40–12
[B] Figure A3-4A

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise Figure A3-4A as follows:

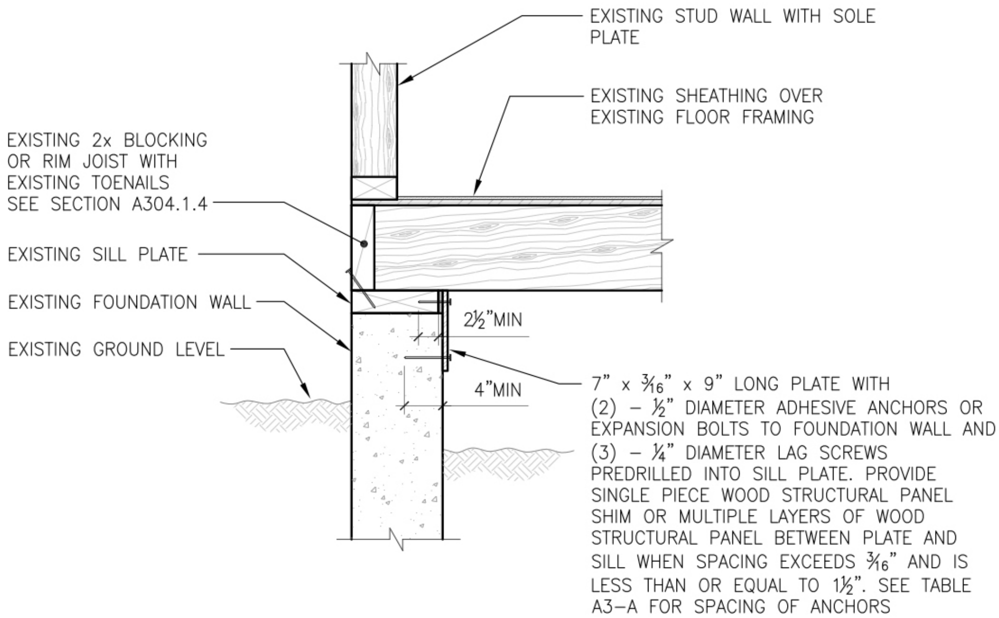
1. Revise note at top left:
Existing 2x BLOCKING OR RIM JOIST WITH EXISTING TOENAILS. SEE SECTION ~~A304.1.4~~ A304.1.3

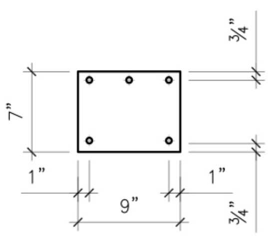
2. Revise long note at right side:
7" x 3/16" x 9" LONG PLATE WITH (2) – ½" DIAMETER ADHESIVE ANCHORS OR EXPANSION ~~BOLTS~~ ANCHORS TO FOUNDATION WALL …

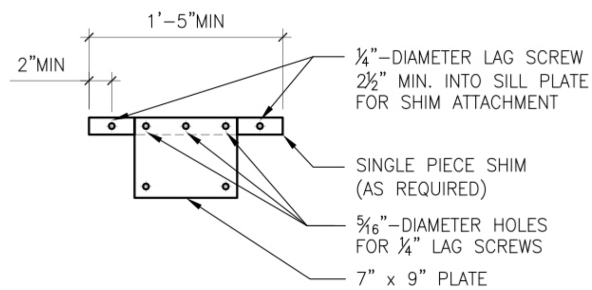
3. Correct note 1 [preferably through errata to the 2012 edition]:
1. If shim space exceeds ~~2 ½ in.~~ 1 ½ in., alternate details will be required.

4. Revise note 2:
Where required, single piece shim shall be ~~foundation grade redwood~~ naturally durable wood or preservative-treated wood. If preservative-treated wood is used, it shall be isolated from the foundation system with a moisture barrier.

5. Correct [preferably through errata to the 2012 edition] and revise title:
FIGURE A3-4A: ~~SILL PLATE BOLTING IN EXISTING FOUNDATION—ALTERNATE~~ ALTERNATE SILL PLATE ANCHORING IN EXISTING FOUNDATION WITHOUT CRIPPLE WALLS AND FLOOR FRAMING NOT PARALLEL TO FOUNDATIONS







HOLE DIAMETER SHALL NOT EXCEED CONNECTOR DIAMETER BY MORE THAN 1/16"

CONNECTION WHEN SHIM SPACE EXCEEDS ¾" IN WIDTH UP TO 1½"

Reason: The proposal makes five editorial changes, two of which reflect errors in production of the 2012 edition (first printing, April 2011) that should preferably be corrected through errata. Bases for the five proposed changes are:

1. Correction of cited code section.
2. Editorial revision for consistent terminology ("anchor," not "bolt")
3. Errata. The correct value of 1 ½ in. was in approved proposal EB54-09/10 but did not make it into print.
4. Editorial revision for consistency with current Section A304.2.6, which was revised for 2012.
5. Errata, with one editorial change for 2015. The correct title, "Alternate sill plate …", was in approved proposal EB54-09/10 but did not make it into print. That approved title actually read "Alternate sill plate bolting in existing foundation …". For terminology consistency, it should now read as proposed here: "Alternate sill plate anchoring in existing foundation …".

Cost Impact: This code change proposal will not increase the cost of construction.

EB40-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

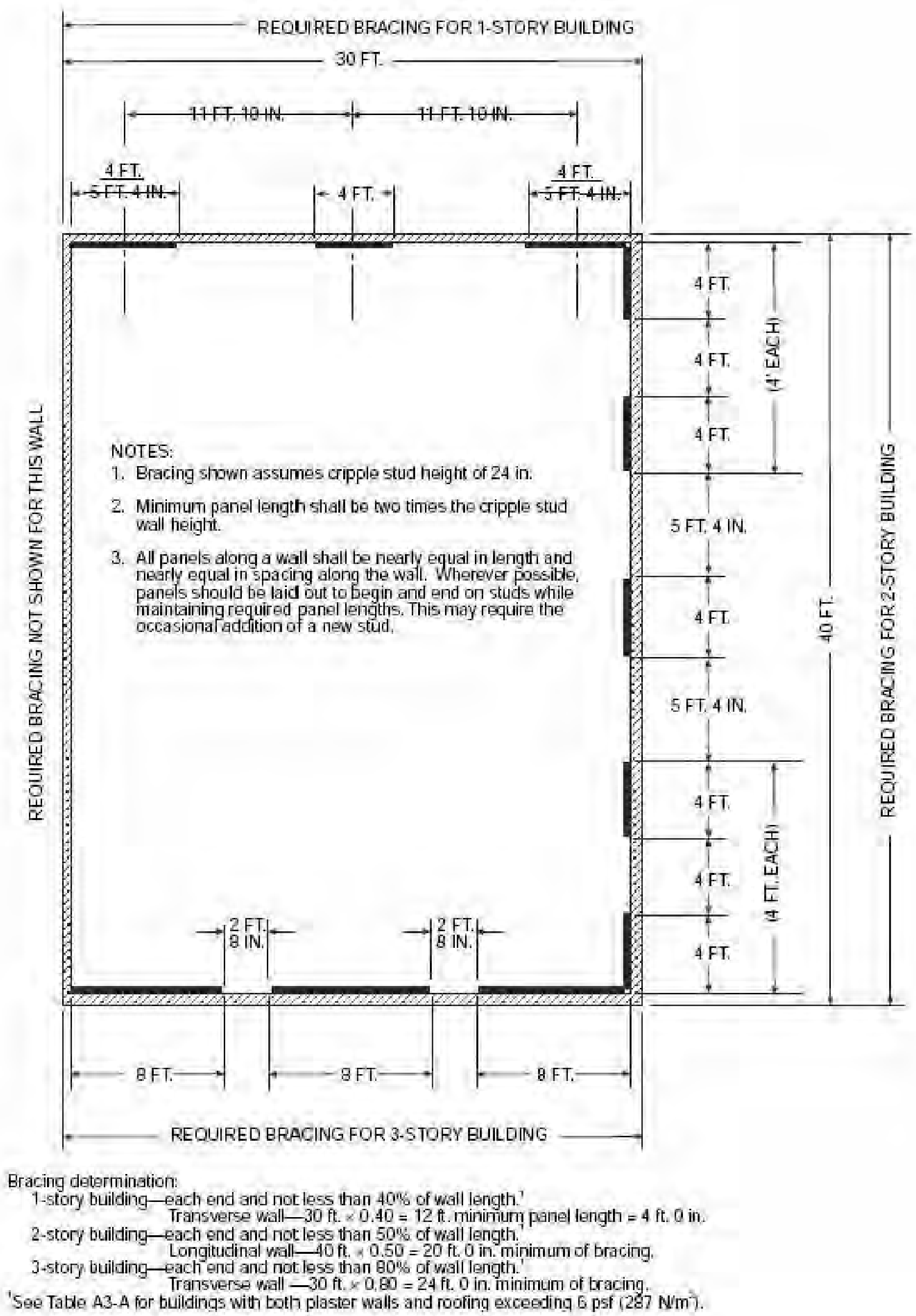
F A3-4A-EB-BONOWITZ

EB41–12
[B] Figure A3-10

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise Figure A3-10 as follows:



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE A3-10—FLOOR PLAN—CRIPPLE WALL BRACING LAYOUT

Reason: The proposal corrects the dimensions shown at the top of Figure A3-10 for 1-story buildings. The calculations at the bottom of the figure are correct, so the figure should be revised in three ways:

- Delete the dimension strings showing 11'-10" spacing between panel centers.
- Change the end panel lengths from 5'-4" to 4'-0" in two places.
- Redraw the end panel lengths to approximate scale as 4-ft long sections.

Cost Impact: This code change proposal will not increase the cost of construction.

EB41-12

Public Hearing: Committee: AS AM D

EB42–12
[B] Table A3-A, [B] Figure A3-3

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] TABLE A3-A
SILL PLATE ANCHORAGE AND CRIPPLE WALL BRACING

a. Sill plate anchors shall be chemical anchors or expansion bolts in accordance with Section A304.3.1.
b. All washer plates shall be <u>3 inches by 3 inches by .229 inch (76 mm x 76 mm x 5.8 mm)</u> ~~2 inches by 2 inches by $^3/_{16}$ inch (51 mm by 51 mm by 4.8 mm)~~ minimum.
c. See Figure A3-10 for braced panel layout.
d. Braced panels at ends of walls shall be located as near to the end as possible.
e. All panels along a wall shall be nearly equal in length and shall be nearly equal in spacing along the length of the wall.
f. The minimum required underfloor ventilation openings are permitted in accordance with Section A304.4.4.

(Portions of Table not shown remain unchanged)

[B] FIGURE A3-3
SILL PLATE BOLTING TO EXISTING FOUNDATION

For SI: 1 inch = 25.4 mm.
NOTES:
1. Plate washers shall comply with the following:
   ½ in. anchor or bolt – ~~2 in. x 2 in. x 3/16 in.~~ <u>3 in x 3 in x 0.229 in (76 mm x 76 mm x 5.8 mm) minimum</u>
   $^5/_8$ in. anchor or bolt – ~~2 in. x 2 in. x 3/16 in.~~ <u>3 in x 3 in x 0.229 in (76 mm x 76 mm x 5.8 mm) minimum</u>
2. See Figure A3-5 or A3-6 for cripple wall bracing.

(Portion of Figure not shown remains unchanged)

Reason: This proposal coordinates the minimum washer size with provisions in IRC Section R602.11. The change is made to both Table A3-A (note b) and Figure A3-3 (note 1).

Note to ICC: The washer size listed in 2012 Figure A3-3 note 1 should already be 3” x 3” x 1/4” per EB54-09/10, but that approved change was apparently not picked up in publication. This should be corrected through IEBC errata

Cost Impact: This code change proposal will not increase the cost of construction.

EB42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T A3-A-EB-BONOWITZ

S1–12
202 (NEW), 1504.4, 1504.6, 1504.7, 1507.12.3, 1507.13.3

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Add new text as follows:

SECTION 202
DEFINITIONS

LOW SLOPE (For application to Chapter 15 only). In roofing, that which commonly describes an incline of a roof which is less than two units vertical in 12 units horizontal (16.7-percent).

Revise as follows:

1504.4 Ballasted low-slope roof systems. Ballasted lowslope ~~(roof slope < 2:12)~~ single-ply roof system coverings installed in accordance with Sections 1507.12 and 1507.13 shall be designed in accordance with Section 1504.8 and ANSI/SPRI RP-4.

1504.6 Physical properties. Roof coverings installed on low-slope roofs ~~(roof slope < 2:12)~~ in accordance with Section 1507 shall demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 155 or ASTM G 154. Those roof coverings that are subject to cyclical flexural response due to wind loads shall not demonstrate any significant loss of tensile strength for unreinforced membranes or breaking strength for reinforced membranes when tested as herein required.

1504.7 Impact resistance. Roof coverings installed on lowslope roofs ~~(roof slope < 2:12)~~ in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the “Resistance to Foot Traffic Test” in Section 5.5 of FM 4470.

1507.12.3 Ballasted thermoset low-slope roofs. Ballasted thermoset low-slope roofs ~~(roof slope < 2:12)~~ shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D 448.

1507.13.3 Ballasted thermoplastic low-slope roofs. Ballasted thermoplastic low-slope roofs ~~(roof slope < 2:12)~~ shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D448.

Reason: This proposed code change is intended to add clarity to the code by providing a specific definition in Chapter 2—Definitions for the term “low slope”, which is used in several instances in Chapter 15.

Currently in Chapter 15, there are several instances where usage of the term low-slope is defined parenthetically as “…(roof slope < 2:12)…”. In other instance, in Section 1504.5, the term is not specifically defined. Adding a specific definition for the term in Section 202—Definitions provides for consistent interpretation throughout the Chapter 15 and allows removal of the parenthetical definition “…(roof slope < 2:12)…”

The addition of the notation to the term limiting the applicability of the definition to Chapter 15 is necessary to avoid possible conflicts with other chapters; a similar notation is also included in Section 202—Definitions for the term “Roof assembly.”

Cost Impact: The code change proposal will not increase the cost of construction.

S1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.4-S-GRAHAM

S2–12
202, 1505.8, 1507.17, 1507.17.1, 1507.17.2, 1507.17.3

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

SECTION 202
DEFINITIONS

PHOTOVOLTAIC ~~MODULES/~~SHINGLES. A *roof covering* ~~composed of flat-plate photovoltaic modules fabricated in sheets that resemble three-tab composite~~ resembling shingles that incorporates photovoltaic modules.

Revise as follows:

1505.8 Photovoltaic systems. Rooftop installed photovoltaic systems that are adhered or attached to the roof covering or photovoltaic ~~modules/~~shingles installed as roof coverings shall be labeled to identify their fire classification in accordance with the testing required in Section 1505.1.

1507.17 Photovoltaic ~~modules/~~shingles. The installation of photovoltaic modules/shingles shall comply with the provisions of this section.

1507.17.1 Material standards. Photovoltaic ~~modules/~~shingles shall be listed and labeled in accordance with UL1703.

1507.17.2 Attachment. Photovoltaic ~~modules/~~shingles shall be attached in accordance with the manufacturer's installation instructions.

1507.17.3 Wind resistance. Photovoltaic modules/shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161. Photovoltaic ~~modules/~~shingles shall comply with the classification requirements of Table 1507.2.7.1(2) for the appropriate maximum nominal design wind speed. Photovoltaic ~~modules/~~shingle packaging shall bear a label to indicate compliance with the procedures in ASTM D 3161 and the required classification from Table 1507.2.7.1(2).

Reason: This code change proposal is intended to clarify the term and definition for "Photovoltaic modules/shingles" in Chapter 2-Definitions and carrying this clarification through to the specific requirements for photovoltaic shingles in Section 1507.17

The word "modules" is being deleted from the term and definition because it is not defined in the code in the context of photovoltaic applications and it is not necessary to clearly identify and define the term. Similarly, "/" is being deleted because it is not necessary to identify or define the term; it is not clear whether the "/" is intended to mean "and" or "or". Also, "flat-plate", "three-tab" and "composite" are being deleted because these are not defined in the IBC and these are not necessary to clearly define the term.

The changes in Section 1505.8 and Section 1507.17 are intended to make the terminology consistent with the revised term in Chapter 2-Definitions.

No changes in the current code's technical requirements are intended with this code change proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

S2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.8 #1-S-GRAHAM

S3–12

202 (NEW), 1505.8, 1509.7, 1509.7.1, 1509.7.2, 1509.7.3, 1511, 1511.1, 3111, 3111.1

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Add new text as follows:

SECTION 202
DEFINITIONS

PHOTOVOLTAIC MODULE. A complete, environmentally protected unit consisting of solar cells, optics, and other components, exclusive of tracker, designed to generate DC power when exposed to sunlight.

PHOTVOLTAIC PANEL. A collection of modules mechanically fastened together, wired, and designed to provide a field-installable unit.

Revise as follows:

1505.8 Photovoltaic ~~systems~~ panels and modules. Rooftop installed photovoltaic ~~systems~~ panels and modules that are adhered or attached to the roof covering or photovoltaic modules/shingles installed as roof coverings shall be labeled to identify their fire classification in accordance with the testing required in Section 1505.1.

1509.7 Photovoltaic ~~systems~~ panels and modules. Rooftop mounted photovoltaic ~~systems~~ panels and modules shall be designed in accordance with this section.

1509.7.1 Wind resistance. Rooftop mounted photovoltaic ~~systems~~ panels and modules shall be designed for wind loads for component and cladding in accordance with Chapter 16 using an effective wind area based on the dimensions of a single unit frame.

1509.7.2 Fire classification. Rooftop mounted photovoltaic ~~systems~~ panels and modules shall have the same fire classification as the roof assembly required by Section 1505.

1509.7.3 Installation. Rooftop mounted photovoltaic ~~systems~~ panels and modules shall be installed in accordance with the manufacturer's installation instructions.

SECTION 1511
SOLAR PHOTOVOLTAIC PANELS AND MODULES

1511.1 Solar photovoltaic panels and modules. Solar photovoltaic panels/modules installed upon a roof or as an integral part of a roof assembly shall comply with the requirements of this code and the *International Fire Code*.

1511.1.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed upon the roof by the photovoltaic panels and modules shall comply with the requirements of Table 601.

Revise as follows:

SECTION 3111
SOLAR PHOTOVOLTAIC PANELS AND MODULES

3111.1 General. Solar photovoltaic panels and modules shall comply with the requirements of this code and the *International Fire Code.*

Reason: This code change proposal is intended to clarify the code by providing specific terms and definitions for photovoltaic devices addressed in the code and then carrying these terms and definitions through to the code's current specific requirements in Section 1505.8, 1509.7, 1511 and 3111.

IBC 2012 currently uses the terminology "photovoltaic systems", which is currently not defined and is not widely recognized in the PV industry. For example, some have questioned whether the term "photovoltaic systems" includes racking and mounting systems, and external wiring. As a result, there appears to be some confusion and possible misinterpretation of the IBC's requirements.

The definitions for the terms "Photovoltaic module" and "Photovoltaic panel" are taken from NFPA 70, "National Electrical Code, 2011 Edition." NFPA is not currently referenced in the IBC; however , it is referenced as a requirement in the *International Fire Code*, Section 605.11.

In Section 1505, the change from "…systems…" to "…panels and modules…" is being made for consistency with the new definitions ion Chapter 2. Also, photovoltaic modules and panels are fire classified according to ASTM E108 or UL790 (and UL1703), which are already included in the IBC. Other photovoltaic system components--such as racking and mounting systems, and external wiring—are not currently fire classified.

In Section 1509.7 and Section 1511, the change from "…systems…" to "…panels and modules…" is being made for consistency with the new definitions in Chapter 2. Also, the terminology "…panels and modules…" already occurs in IBC 2012's Section 1509.7.4.

Cost Impact: The code change proposal will not increase the cost of construction.

S3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.8 #2-S-GRAHAM

S4–12
202 (NEW), 1507.16, 1507.16.1, 1607.12.3, 1607.12.3.1

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Add new text as follows:

SECTION 202
DEFINITIONS

Vegetative roof. An assembly of interacting components designed to waterproof and normally insulate a building's top surface that includes, by design, vegetation and related landscape elements.

Revise as follows:

1507.16 Vegetative roofs, roof gardens and landscaped roofs. Vegetative roofs, roof gardens and landscaped roofs shall comply with the requirements of this chapter and Sections 1607.12.3 and 1607.12.3.1 and the *International Fire Code*.

1507.16.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed upon the roof by the vegetative roof, roof gardens or landscaped roofs shall comply with the requirements of Table 601.

Revise as follows:

1607.12.3 Occupiable roofs. Areas of roofs that are occupiable, such as vegetative roofs, roof gardens, or for assembly or other similar purposes, and marquees are permitted to have their uniformly distributed live loads reduced in accordance with Section 1607.10.

1607.12.3.1 Vegetative and landscaped roofs. The uniform design live load in unoccupied landscaped areas on roofs shall be 20 psf (0.958 kN/m2). The weight of all landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil.

Reason: This code change proposal is intended to use terminology in the IBC that is consistent with that of the *International Green Construction Code* (IgCC). IgCC uses the terminology "vegetative roof" for what is referred to in the IBC as a "roof garden" or "landscaped roof".

This code change proposal adds a definition for the term "vegetative roof" in Section 202. The definition is identical to that in the IgCC and ASTM D1079, "Standard Terminology Relating to Roofing and Waterproofing." The term "vegetative roof" is also added where appropriate in Section 1507.16 and Section 1607.12.3.

Cost Impact: The code change proposal will not increase the cost of construction.

S4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.16-S-GRAHAM

S5–12
202 (NEW)

Proponent: Christine Covington, Solar Energy Industries Association

Add new text as follows:

SECTION 202
DEFINITIONS

BUILDING INTEGRATED PHOTOVOLTAIC (BIPV) SYSTEM. A system that incorporates photovoltaic modules, which covert solar radiation into electricity, as a component of building products that simultaneously provide protection against weather and water entry into the building envelope.

PHOTOVOLTAIC PANEL SYSTEM. A system that incorporates discrete photovoltaic panels, which covert solar radiation into electricity, onto rack support systems which are supported by building structural systems such as roof, floor, or wall assemblies.

Reason: The IBC references different applications of photovoltaic systems in various locations throughout the code without definition. The intent of this change is to provide basic definitions for photovoltaic systems that are embedded in building construction elements (BIPV's) and for systems that are installed extraneous to new or existing building elements (Panel Systems). This is critical in determining the type of testing that will be appropriate for each system. Currently, BIPV's used as roof shingles must pass UL 790 or ASTM E108 to determine fire classification while panel systems used above fire classified roofs must undergo testing in conjunction with UL 1703.

Cost Impact: The code change proposal will not increase the cost of construction.

S5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-BUILDING INTEGRATED PHOTOVOLTAIC SYSTEM-S-COVINGTON.doc

S6–12
1503.2 (NEW), 1510.1

Proponent: Mark S. Graham/National Roofing Contractors Association/representing National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1503.2 Energy efficiency: Roof assemblies shall be designed and constructed in accordance with Chapter 13 and the *International Energy Conservation Code*.

1510.1 General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

Exceptions:

1. Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide positive roof drainage.
2. *Reroofing* is permitted without requiring the entire building or structure comply with Section 1503.2 and the energy requirements of the *International Energy Efficiency Code*. *Roof replacement* shall conform to the energy requirements for roof assemblies of the *International Energy Efficiency Code*.

Reason: : This code change proposal is intended to add a direct statement in Chapter 15 indicating roof assemblies are required to comply with Chapter 13-Energy Efficiency and the *International Energy Conservation Code*.

For reroofing, the proposed new language in Section 1510.1 is intended to clarify reroofing does not require upgrading the entire building (or structure) to the current energy code. Roof replacement shall comply with the current energy code. The terms "reroofing" and "roof replacement" are already defined in Chapter 2-Definitions.

Cost Impact: The code change proposal will not increase the cost of construction.

S6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1503.2(NEW)-S-GRAHAM.doc

S7–12
1503.5

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1503.5 ~~Roof~~ Attic ventilation. Intake and exhaust vents shall be provided in accordance with Section 1203.2 and the roof covering manufacturer's installation instructions.

Reason: This code change proposal is intended to clarify the intent of the Code.

While Section 1503.5 is titled "Roof ventilation," the section that is referenced is Section 1203.2-Attic Spaces. On this basis, change the title of Section 1503.5 to "Attic ventilation" appears appropriate.

Also, the code language also makes reference "…the manufacturer's installation instruction." But does not clearly stipulate the manufacturer of which product (roof covering, roof deck, etc.) is intended. "…roof covering…" is added in this proposal to clarify compliance with the roof covering manufacturer's installation instruction are intended to required.

Cost Impact: The code change proposal will not increase the cost of construction.

S7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1503.5-S-GRAHAM

S8–12

1504.1.1, Table 1504.1.1(1), Table 1504.1.1(2), 1507.2.7.1, Table 1507.2.7.1(1), Table 1507.2.7.1(2), 1609.5.2

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1504.1.1 Wind resistance of asphalt shingles. Asphalt shingles shall ~~comply with Section 1507.2.7.~~ be tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table 1504.1.1(1) for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table 1504.1.1(1).

> **Exception:** Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table 1504.1.1(2).

**TABLE 1504.1.1(1)
CLASSIFICATION OF ASPHALT
ROOF SHINGLES IN ACCORDANCE WITH ASTM D 7158[a]**

NOMINAL DESIGN WIND SPEED, V_{asd}[b] (mph)	CLASSIFICATION REQUIREMENT
85	D, G or H
90	D, G or H
100	G or H
110	G or H
120	G or H
130	H
140	H
150	H

For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.
a. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.
b. V_{asd} shall be determined in accordance with Section 1609.3.1.

**TABLE 1504.1.1(2)
CLASSIFICATION OF ASPHALT SHINGLES IN ACCORDANCE WITH ASTM D 3161**

NOMINAL DESIGN WIND SPEED, V_{asd}[a] (mph)	CLASSIFICATION REQUIREMENT
85	A, D or F
90	A, D or F
100	A, D or F
110	F
120	F
130	F
140	F
150	F

For SI: 1 mph = 0.447 m/s.
a. V_{asd} shall be determined in accordance with Section 1609.3.1.

~~**1507.2.7.1 Wind resistance.** Asphalt shingles shall be tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table 1507.2.7.1(1) for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table 1507.2.7.1(1).~~

~~**Exception:** Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table 1507.2.7.1(2).~~

~~TABLE 1507.2.7.1(1)~~
~~CLASSIFICATION OF ASPHALT~~
~~ROOF SHINGLES PER ASTM D 7158~~[a]

~~**NOMINAL DESIGN WIND SPEED, V_{asd}[b] (mph)**~~	~~**CLASSIFICATION REQUIREMENT**~~
~~85~~	~~D, G or H~~
~~90~~	~~D, G or H~~
~~100~~	~~G or H~~
~~110~~	~~G or H~~
~~120~~	~~G or H~~
~~130~~	~~H~~
~~140~~	~~H~~
~~150~~	~~H~~

~~For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.~~
~~a. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.~~
~~b. V_{asd} shall be determined in accordance with Section 1609.3~~

~~TABLE 1507.2.7.1(2)~~
~~CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161~~

~~**NOMINAL DESIGN WIND SPEED, V_{asd}[a] (mph)**~~	~~**CLASSIFICATION REQUIREMENT**~~
~~85~~	~~A, D or F~~
~~90~~	~~A, D or F~~
~~100~~	~~A, D or F~~
~~110~~	~~F~~
~~120~~	~~F~~
~~130~~	~~F~~
~~140~~	~~F~~
~~150~~	~~F~~

~~For SI: 1 mph = 0.447 m/s.~~
~~a. V_{asd} shall be determined in accordance with Section 1609.3.1.~~

Revise as follows:

1609.5.2 Roof coverings. Roof coverings shall comply with Section 1609.5.1.

Exception: Rigid tile roof coverings that are air permeable and installed over a roof deck complying with Section 1609.5.1 are permitted to be designed in accordance with Section 1609.5.3.

Asphalt shingles installed over a roof deck complying with Section 1609.5.1 shall comply with the wind resistance requirements of Section ~~1507.2.7.1~~ 1504.1.1.

Reason: This code change proposal is intended to relocate the Code's wind resistance requirements for asphalt shingles to the same section where similar wind resistance requirements are provided for other roof system types.

Wind resistance requirements (e.g., testing, classification) for all roof system types and components—other than those for asphalt shingles—are provided in Section 1504-Performance Requirements. The wind resistance requirements for asphalt shingles are currently provided in Section 1507-Requirements for Roof Coverings, specifically in Section 1507.2.7.1-Wind Resistance. The placement of the wind resistance requirements in the asphalt shingle section instead of the performance requirements section dates back to the legacy codes era when wind resistance for asphalt shingles was addressed by prescriptive language (e.g., four or six fasteners per strip shingle) instead of performance-based measures. Today, specific test methods (ASTM D7158 and ASTM D3161) and classifications (Class D, Class F, Class G, etc.) exist and are incorporated into the IBC making placement of the requirements for asphalt singles in Section 1504-Performance Requirements appropriate. Section 1504.1.1-Wind Resistance of Asphalt Shingles already exists in Section 1504-Performance Requirements and currently serves as a pointer to Section 1507.2.7. This code change proposals moves the applicable wind resistance language from Section 1507.2.7 to Section 1504.1.1, replacing the pointer. Also, in

Chapter 16-Structural Design, a pointer to Section 1507.2.7.1 occurs in the Exception to Section 1509.5.2-Roof Coverings; this pointer is redirected to Section 1504.1.1.

This code change proposal does not include any technical changes in the wind resistance requirements for asphalt shingles. This code change proposal is merely a rearrangement into the proper location of the Code's existing requirements for asphalt shingles wind resistances.

Cost Impact: The code change proposal will not increase the cost of construction.

S8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.1.1-S-GRAHAM

S9–12

1504.3.1.1 (NEW), Chapter 35 (NEW)

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

Add new text as follows:

1504.3.1.1 Nonballasted low slope roofs. Nonballasted low slope (roof slope < 2:12) roof systems with built-up, modified bitumen, fully adhered or mechanically attached single-ply shall be installed in accordance with ANSI/SPRI WD-1.

Add new standard to Chapter 35 as follows:

ANSI/SPRI

WD-1-XX Wind Design Standard Practice for Roofing Assemblies

Reason: There are two primary reasons that ANSI/SPRI WD-1 should be included as a reference standard in the IBC.

1. The International Building Code provides specific requirements for calculating the wind uplift load pressure on the roof assembly. However it does not currently provide a prescriptive method to enhance the perimeter and corner attachment due to the higher wind loads in these regions. ANSI/SPRI WD-1 is a national consensus standard that has been reviewed by testing laboratories, membrane manufacturers, roofing system component suppliers, contractors and consultants. This standard provides prescriptive requirements for corner and perimeter enhancement. The user first identifies a suitable roof assembly that will resist the calculated wind uplift pressure for the field of the roof, then enhances the fastening pattern to meet the calculated corner and perimeter wind uplift load pressure. Designing the roof system to resist the higher wind loads at the perimeter and corner regions is accomplished by either adding additional fasteners or increasing the amount of adhesive used, depending upon the specific roof system chosen. This approach allows the user to work from one base assembly and enhance the attachment of the base assembly for perimeter and corner regions instead of trying to locate tested assemblies for each of these areas.

The ANSI/SPRI standard also requires that a 2.0 safety factor be applied to tested wind uplift values, unless another value is specified. So, for example, if a roof system passes a wind uplift test at 120 lbs/ft2, this value is divided by 2 before determining if the system will resist the calculated wind uplift pressure loads for the building. This safety factor has historically been used by the roofing industry to account for variables between tested loads and performance in the field. These variables include deviations in installation and the fact that the wind load test procedures used incorporate static applied loads while dynamic, cyclic loads occur in the field. The IBC does not currently contain this requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.3.1.1 (NEW)-S-ENNIS

S10–12
1504.3.1

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1504.3.1 Other roof systems. Roof systems with built-up, modified bitumen, fully adhered or mechanically attached single-ply ~~through fastened metal panel~~ roof systems, and other types of membrane roof coverings shall also be tested in accordance with FM 4474, UL 580 or UL 1897.

Reason: This code change proposal is intended to clarify the Code.

This code change proposal intends to remove "…through fastened metal panel…" from Section 1504.3.1 as this specific roof system type is already addressed in Section 1504.3.2-Metal Panel Roof Systems. The inclusion of wind resistance requirements for through fastened metal panel roof systems in Section 1504.3.1 appears to be a misprint as test methods FM 4474 and UL 1897 included in this section do not apply to metal panel roof systems.

Addressing the wind resistance of through fastened metal panel roof system in Section 1504.3.2-Metal Panel Roof Systems is appropriate as the test methods in this particular section are applicable to metal panel roof systems.

Cost Impact: The code change proposal will not increase the cost of construction.

S10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.3.1-S-GRAHAM

S11–12
1504.3.1

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1504.3.1 Other roof systems. ~~Roof systems with built~~ <u>Built</u>-up, modified bitumen, fully adhered or mechanically attached single-ply ~~through fastened metal panel~~ roof systems, and other types of membrane roof coverings shall also be tested in accordance with FM 4474, UL 580 or UL 1897.

Reason: The first change is purely editorial – the sentence doesn't need to reference "roof systems" twice. Also, this section should not include reference to through fastened metal panel roof systems, since they are covered in Section 1504.3.2.

Cost Impact: The code change proposal will not increase the cost of construction.

S11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.3.1-S-MANLEY

S12–12
1504.3.2

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1504.3.2 Metal panel roof systems. Metal panel roof systems through fastened or standing seam shall be tested in accordance with UL 580 or ASTM E 1592.

Exceptions:

1. Metal roofs constructed of cold-formed steel, where the roof deck acts as the roof covering and provides both weather protection and support for structural loads, shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2210.1.
2. Metal roofs constructed of aluminum, where the roof deck acts as the roof covering and provides both weather protection and support for structural loads, shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2002.1.

Reason: This code change proposal is intended to permit the use of the Aluminum Association's *Aluminum Design Manual* (ADM1), which is already referenced in Section 2002.1, for the design of wind resistance for aluminum structural panel roof systems in lieu of the test methods prescribed in Section 1504.3.2.

A similar exception for structural metal panels fabricated from cold-formed steel already exists in Section 1504.3.2; it allows the use of AISI S100, "North American Specification for the Design of Cold-formed Steel Structural members."

Cost Impact: The code change proposal will not increase the cost of construction.

S12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.3.2-S-GRAHAM

S13–12
1504.3.2

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org) and Lee Shoemaker, Metal Building Manufacturer's Association

Revise as follows:

1504.3.2 Metal panel roof systems. ~~Metal~~ Standing seam metal panel roof systems ~~through fastened or standing seam~~ shall be tested in accordance with ~~UL 580 or~~ ASTM E 1592. Through-fastened panel roof systems shall be tested in accordance with UL 580 or ASTM E1592.

> **Exception:** Metal roofs constructed of cold-formed steel, where the roof deck acts as the roof covering and provides both weather protection and support for structural loads, shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2210.1.

Reason: The recommended language provides consistency with the uplift test requirements for standing seam roofs systems as specified in AISI S100, Section D6.2.1. AISI S100 requires that standing seam roofs be tested in accordance with ASTM E1592 to determine panel strength and UL580 is not an optional test for this type of roof system. Panel strengths for through fastened roofs, on the other hand, as specified in AISI S100, can be developed either analytically or through testing in accordance with either UL 580 or ASTM E1592.

Cost Impact: The code change proposal will not increase the cost of construction.

S13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.3.2-S-MANLEY

S14–12
1504.4

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

Revise as follows:

1504.4 Ballasted low-slope roof systems. Ballasted lowslope (roof slope < 2:12) single-ply roof system coverings installed in accordance with Sections 1507.12 and 1507.13 shall be designed in accordance with Section 1504.8 and ANSI/SPRI RP-4. <u>Ballasted roof systems shall be subject to the special inspection requirements of Section 1705.10 to verify conformance to ANSI/SPRI RP-4 standard.</u>

Reason: During the 2005/2006-code change cycle a proposal was submitted to prohibit gravel or stone used as ballast on the roof of a building located in a hurricane-prone regions or on any other building with a mean roof height exceeding prescribed limits based on the building height, exposure category and basic wind speed at the site. These requirements are contained in Section 1504.8. These restrictions were imposed due to damage that occurred reportedly due to wind borne roof aggregate during high wind events. The building height restrictions were imposed due to calculated values.

Prior to this code change proposal the design of ballasted roofs were required to meet ANSI/SPRI RP-4 Wind Design Standard For Ballasted Single-ply Roofing Systems. While this is still a requirement, the code change that occurred due to this proposal now requires that both requirements be met, i.e. the requirements included in the proposal and the requirements of RP-4. This leads to conflicting requirements.

The issue with gravel blow-off that was raised by the NCSEA is that non-code compliant ballasted roof systems are being installed, which is particularly problematic in areas with the potential for high wind events. If these roof systems were installed in accordance with ANSI/SPRI RP-4, then this would not be an issue since this standard is specifically designed to prevent gravel blow-off. This statement is based on the fact that the roof systems that were reported by the NCSEA were investigated and found that they did not conform to the design requirements of the code-referenced standard, ANSI/SPRI RP-4.

To address the issue of gravel blow-off, this code change proposal requires special inspection of ballasted roof assemblies to verify conformance with ANSI/SPRI RP-4 if they are being installed in high wind regions as defined in Section 1705.10 Special inspections for wind resistance.

The ANSI/SPRI RP-4 standard was first included in the building code in 1988. It has demonstrated excellent performance, with no reports of gravel or roof blow-off on systems designed in accordance with the standard. Over 6 billion square feet of ballasted single ply roofing applications have been installed over the last two decades The vast majority of these systems have performed very well with respect to their resistance to wind pressure loads. However some damage has been observed due to aggregate blowing off non-code compliant roofs during high wind events, as noted in the NCSEA proposal.

The ANSI/SPRI Ballast Design Guide is based on over 200 wind tunnel tests conducted at the National Research Council of Canada (NRCC). This is the largest commercially available wind tunnel in North America. The tunnel and the experts at the NRCC have used this tunnel to design some of the largest suspension bridges in the world. In addition, over 40 years of field experience and observations from hurricane investigation teams from RICOWI and FEMA have been used in the development of the design criteria.

ANSI/SPRI RP-4 was revised and re-approved in 2008 and is currently being balloted for re-approval. The ballot currently out for re-approval updates the standard to ASCE7-10 requirements. One of the design objectives of ANSI/SPRI RP-4 is to prevent gravel blow-off. The above-mentioned wind tunnel testing evaluated conventional stone ballasted and stone and paver ballasted protected membrane roofs. For the systems containing stone ballasting the primary objective was to determine 4 critical wind speeds:

1. U_{c1} – the wind speed at which one or more stones were first observed to move an appreciable distance (i.e. several inches)
2. U_{c2} – the wind speed above which scouring of stones would continue more or less indefinitely as long as the wind speed is maintained.
3. U_{c3} – the wind speed at which stones were first observed to leave the roof by going over the upstream parapet (this was the parapet adjacent to the wind direction)
4. U_{c4} – the wind speed at which stones were first observed to leave the roof by going over the downstream parapet (opposite side from the wind)

In these experiments three nominal stone sizes were used. Each nominal stone size represented a mixture of stone sizes (larger and smaller) similar to the gradation, which would be obtained from a stone quarry. These experiments evaluated the impact of the following variables on the critical wind speeds defined above:

- Stone size
- Parapet height
- Building height
- Building geometry
- Direction of wind impacting the building
- Rooftop wind speed, rooftop gust wind speed, and the shape of the approaching wind velocity profile

The basic approach taken in the ANSI/SPRI RP-4 standard is that as the anticipated wind load on the roof increases due to variables such as design wind speed, building height, exposure category and parapet height, the ballast design requirements get more robust by using larger stone, or substituting pavers for stone, and ultimately not allowing for the use of a ballasted roof system.

The ballast designs contained in the national consensus standard provide restrictions on the use of ballasted single ply roof systems that will allow for the responsible use of aggregate surfacing. There is often the potential for building envelope materials, and many other materials, to become windborne debris in hurricane force wind exposures. In these situations, the approach is to learn how to properly use these materials in high wind areas, not ban their use. The ANSI/SPRI RP-4 standard allows for the continued use of ballasted roofing systems, which are a cost effective method to keep the roof system in place and to improve the energy performance of the building. (Reference the SPRI/DOE/ORNL report on energy effectiveness of ballasted roof systems by going to the following web link, http://www.spri.org/publications/policy.htm under Technical Reports. Select the research report entitled: Evaluating the Energy Performance of Ballasted Roof Systems.

Two of the most critical controlling factors identified through this extensive test program on the various critical wind speeds were stone size and parapet height. A brief summary of the wind tunnel test program, and reports written as part of this program follows. The reports can be viewed in the entirety at the same web link provided above for the energy study report. The wind tunnel reports are located at the bottom of that page under Miscellaneous.

LTR-LA-142 Estimation of Critical Wind Speeds for Scouring of Gravel or Crushed Stone on Rooftops January 1974

Objectives:

- Determine the critical wind speeds and corresponding surface shear stress that cause movement of various stone sizes and shapes by taking direct measurements of these values via wind tunnel testing.
- Use this data to determine constants that can be used in equations to calculate critical surface shear stress
- Obtain guidance about the effects of parapets and obstacles, which cause strong three-dimensional effects, notably vortices.

Conclusions:

- The surface shear stress required to cause stone motion is directly proportional to nominal stone diameter.
- The constant of proportionality appears to be essentially independent of stone size and shape and of the detailed shape of the velocity profile near the gravel surface.
- Critical wind speeds to initiate stone motion can therefore be easily predicted if the relationship between surface shear stress and wind speed is known for the situation of interest.
- The dead air region behind a parapet extended downstream about 15 parapet heights. The turbulence of natural wind will tend to reduce the dead air zone.

LTR-LA-162 Wind Tunnel Tests on Some Building Models to Measure Wind Speeds at Which Gravel is Blown Off Rooftops June 1974

Objectives:

- This series of tests was conducted to build upon the data obtained in the January 1974 test series. Specifically to provide data for some typical building geometries and to investigate the effects of building form, building height, parapet height, wind direction, and gravel size on the critical wind speeds required to cause scouring and blow-off of roofing gravel.
- In this series 1/10 scale models were evaluated in a 30' x 30' wind tunnel.

Conclusions

- The critical wind speeds at which scouring of nominal 0.9", 1.5" and 2.8" diameter gravel (scaled to 1/10 size) occurs and begins to blow-off rooftops were investigated. The nominal sizes represent the average size of a typical mixture.
- The critical wind speeds are lowest when the wind direction is at or about 45° to the walls of the building.
- For a given building configuration the critical wind speeds are proportional to the square root of the gravel size.
- The critical wind speeds increase with increasing parapet height and decrease with increasing building height.
- The length:width ratio of the building is unimportant as long as the width and length are large compared to the parapet height.

NRC No. 15544 Design of Rooftops Against Gravel Blow-Off September 1976

Objectives:

- This report describes a procedure that can be used to estimate the wind speeds at which gravel of a given nominal size will be blown off rooftops.
- The report also describes a procedure for determining design wind speeds at rooftop level.
- The gravel blow-off procedure is based on data obtained from previous wind tunnel tests described above.

Conclusions

- The results of wind tunnel tests conducted to determine critical wind speeds for scour or blow-off of roofing gravel for a specific low-rise building shape can be generalized to apply to any low-rise rectangular building having a flat rooftop.
- Similar generalization is possible for high-rise shapes of any particular length: width ratio.
- This permits development of a general, easy to use procedure for estimating critical wind speeds required to cause scour or blow-off of roofing gravel from various building configurations.

LTR-LA-189 Further Wind Tunnel Tests on Building Models to Measure Wind Speeds at Which Gravel is Blown Off Rooftops August 1977

Objectives:

- Obtain additional data to permit previously obtained results to be generalized so as to be applicable to any rectangular flat-roofed low-rise building.
- Provide data on the effects of substituting solid paving blocks for loose gravel in the most wind sensitive areas of the rooftop.

Conclusions:

- The wind speed at rooftop level appears to be the dominant factor in controlling gravel scour and blow-off as opposed to the wind velocity profile.
- The measured wind speeds at rooftop level were used to reinterpret the data from previous wind tunnel tests.
- Within the boundaries of experimental scatter the critical wind speeds are independent of the rooftop level in the wind boundary layer, allowing for generalization of results to various building heights and geometries.

LTR-LA-234 Model Studies of the Wind Resistance of Two Loose-Laid Roof-Insulation Systems May 1979

Objectives:

- Investigate the resistance of protected membrane roof systems to damage from high winds.
- Identify wind speeds and failure mechanisms for protected membrane roof systems.

Conclusions:

- The results show that wind flows induce pressure distributions underneath the roof-insulation systems as well as on their exterior surfaces.
- These pressure differences cause uplift and are responsible for system failure.
- The wind speed to cause failure for the 2 ft. x 2 ft. paver slabs was found to be proportional to the square root of the system weight per unit area. This relationship should also be true for different geometries.

LTR-LA-269 Further Model Studies of the Wind Resistance of Two Loose-Laid Roof-Insulation Systems (High Rise Buildings) April 1984

Objectives:

- This study is an extension of the May 1979 study, to investigate the resistance of various protected membrane roof systems to damage from high winds when they are installed on high-rise buildings.

Conclusions:

- The mechanisms for wind damage are the same as those identified in earlier tests, namely gravel scour and uplifting of boards by pressure forces.
- The static pressure underneath boards or pavers tend to become equal to the exterior surface because of airflow through the joints between boards or pavers. Complete equalization cannot occur, however, in regions where the exterior pressure distribution is highly non-linear and uplifting pressure differences occur in those regions. System failure therefore tends to occur in these regions.
- High parapets are very effective in increasing resistance to wind damage.
- Mechanical interconnection of boards or pavers by use of strapping, tongue & groove, etc. is an effective method for increasing wind resistance.
- For any particular system configuration, the wind speed to cause failure is proportional to the square root of the system weight per unit area.
- Gust speed at rooftop level is the pertinent speed for use in assessing the resistance of the roofing system to wind damage.

LTR-LA-294 Further Wind Tunnel Tests of Loose-Laid Roofing Systems April 1987

Objectives:

- Conduct extensive wind tunnel work to further assess the resistance to wind damage of protected membrane roofing system using paver slabs, or similar elements.
- Low, intermediate and high-rise buildings were tested, each with several parapet heights.

Conclusions:

- When a membrane is loose-laid on a leaky roof deck, ballooning will occur due to air flowing through holes in the deck from the interior of the building. This will normally result in failure at wind speeds well below those required to product failure by other mechanisms.
- In the case of immobile membranes, failure results from pressure differences, which develop across elements in some regions of the roof.
- Increased parapet height generally resulted in more favorable pressure distributions. That is, maximum suctions were reduced and suction peaks were broadened, so that pressure was less non-uniform and therefore increased failure speeds could be expected.
- Element size has a noticeable effect on failure speed, i.e. failure speeds were higher for larger elements.
- Pressure non-uniformity is reduced by vortex generators mounted on the parapets near the upwind corner of the roof, thus increasing failure wind speeds.

LTR-LA-295 Pressure Distribution Data Measured During the September 1986 Wind Tunnel Tests on Loose-Laid Roofing Systems September 1987

Objectives:

- This report supplements LTR-LA-294 by including contour plots of mean and peak roof surface pressure coefficients and mean and peak coefficients for pressure differential between the upper surface and the underside of the roofing system.

Cost Impact: This proposal will increase the cost of construction. The cost increase will be due to the cost of doing a special inspection if the system is being installed in a region described in Section 1705.10 Special inspections for wind resistance.

S14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.4-S-ENNIS

S15–12
1504.5.1 (NEW), Chapter 35 (NEW)

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

Add new text as follows:

1504.5.1 Gutter securement for low-slope roofs. Low-slope (roof slope < 2:12) roof system gutter securement shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with ANSI/SPRI GD-1, except V_{ult} wind speed shall be determined from Figure 1609A, 1609B, or 1609C as applicable.

Add new standard to Chapter 35 as follows:

SPRI

ANSI/SPRI GD-1-2010 Structural Design Standard for Gutter Systems Use with Low-Slope Roofs

Reason: Currently the IBC contains no requirement that gutters be designed and installed to resist wind and static loads. Studies of the aftermaths of hurricanes revealed a need for better gutter system design. Examples of these observations are shown below. SPRI developed this Standard in response to those studies.

The wind resistance tests contained in this standard measure the resistance of the gutter system to wind forces acting outwardly (away from the building.) and to wind forces acting upwardly tending to lift the gutter off the building. The standard also measures the resistance of the gutter system to static forces of water and ice acting downwardly.

Following are observations of results of gutter failures during high wind events. These observations were made during post hurricane investigations conducted by RICOWI (Roofing Industry Committee on Weather Issues).

Figure 1

Figure 1 is a photo was taken of the gutter/cleat attachment after Hurricane Ike, and is a good example of damage progression. This building, located in Anahuac, TX, experienced wind speeds of 110 mph. The inspection team determined that an overhanging gutter and fractured nailer provided a starting point for peel-back of this multi-ply membrane. The roof membrane peeled away from the insulation layer over most of the roof as shown in Figure 2.

Figure 2

Figure 3 is a photo of a building located in Dickinson, TX after Hurricane Ike. This building experienced wind speeds of 100 mph.

Figure 3

In this case the inspection team determined that a cornering wind caused detachment of the gutter and metal edge, allowing wind to infiltrate and pressurize the roof membrane which led to roll-back of the metal roof membrane, exposing the underlying substrate.

Figure 4 is of a building located in Lumberton, MS. This photo was taken after Hurricane Katrina. Estimated wind speed at this location was 110 to 120 mph.

Figure 4

The inspection team noted that approximately two-thirds of the roof membrane was blown off the roof. Initial failure appears to have occurred at the south roof edge where approximately 25 ft of gutter and edge nailer separated from the structure. A vented 3 ft deep soffit may have contributed to the damage by pressurizing the space between deck and roof assembly. However, the roof assembly may have been pressurized by failure of the south roof edge.

Cost Impact: The code change proposal may increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.5.1 (NEW)-S-ENNIS

S16–12

1504.7, 1504.7.1 (NEW), 1504.7.2 (NEW), Chapter 35 (NEW)

Proponent: Phillip J. Smith, FM Approvals (Phillip.smith@fmapprovals.com)

Revise as follows:

1504.7 Impact resistance. Impact resistance of roof coverings shall be in accordance with Section 1504.7.1 or 1504.7.2, as applicable.

1504.7.1 Low-slope roofs. Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

1504.7.2 Asphalt shingles. Asphalt shingles shall meet Class 1, 2, 3 or 4 based on the results of tests conducted in accordance with ANSI/FM 4473.

Add new standard to Chapter 35 as follows:

FM

4473-11 Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls

Reason: Low sloped roofs (< 2:12) are required to meet specific impact resistance. This change addresses impact resistance of shingles applied in steep slope applications.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S16-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.7.1-S-SMITH(NEW)

S17–12

1504.9 (NEW), Chapter 35 (NEW)

Proponent: Mike Ennis (Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

Add new text as follows:

1504.9 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1507.16 and shall be installed in accordance with ANSI/SPRI RP14.

Add new standard to Chapter 35 as follows:

SPRI
ANSI/SPRI RP14-2010 Wind Design Standard for Vegetative Roofing Systems

Reason: Section 1507.16 requires that roof gardens and landscaped roofs comply with the requirements of Chapter 15. Section 1504.1 provides requirements for wind resistance of various roofing assemblies, however no guidance is provided for designing roof gardens and landscaped roofs to withstand wind loads. Roof gardens and landscaped roofs perform in the same manner as ballasted single ply roof assemblies when exposed to wind loads. ANSI/SPRI RP14 is a national consensus standard that has been developed in cooperation with Green Roofs for Healthy Cities with input from roof membrane manufacturers, component suppliers, contractors, green roofing professionals, testing organizations, and consultants. This design standard is much like the ballast design guide for single-ply roofs currently recognized by the IBC (ANSI/SPRI RP4). It provides the user with a series of tables that define requirements based on design wind speed, building height, parapet height and wind exposure. Three design options are provided. These design options vary in their ability to resist wind loads. Design option 1 uses a 10 lbs/ft2 minimum required load of growth media or trays, Design option 2 also requires minimum 10 lbs/ft2 of growth media or trays in the field of the roof and 13 lbs/ft2 of growth media or interlocking trays or 22 lbs/ft2 of individual trays in the corner and perimeter regions. Design option 3, which is designed for high wind load areas, requires 13 lbs/ft2 of growth media or interlocking trays, or 22 lbs/ft2 of individual trays in the field of the roof and does not allow any loose growth media or trays in the perimeter and corner regions. The perimeter of the building is defined as 40% of the building height. Adjustments are provided to increase the wind resistance of the design based on specific building conditions such as the buildings importance factor, large openings in adjacent walls and rooftop projections to name a few. The standard also provides requirements for newly planted garden roofs that do not have fully developed root systems. Fully developed root systems allow the garden roof assembly to perform very well when exposed to high wind situations, however prior to development of the root system special precautions must be taken.

The basis for the standard includes wind tunnel data generated in support of the ballasted single ply design guide. This wind tunnel testing helped develop an understanding of the impact of particle size and parapet height on the performance of ballasted assemblies. It also provided information regarding the weight of ballast required to keep the roof systems in place at various wind speeds. This data, along with 50-years of garden roof performance data from both the US and Europe were used in the development of this standard.

Cost Impact: The code change proposal may increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.9 (NEW) #1-S-ENNIS

S18–12
1504.9 (NEW), Chapter 35 (NEW)

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

Add new text as follows:

<u>**1504.9 Roof gardens and landscaped roofs.** Roof gardens and landscaped roofs shall comply with Section 1507.16 and shall be installed in accordance with ANSI/SPRI RP14. Garden and landscaped roof systems shall be subject to the special inspection requirements of Section 1705.10 to verify conformance to ANSI/SPRI RP-14.</u>

Add new standard to Chapter 35 as follows:

SPRI
<u>ANSI/SPRI RP-14-2010 Wind Design Standard for Vegetative Roofing Systems</u>

Reason: Section 1507.16 requires that roof gardens and landscaped roofs comply with the requirements of Chapter 15. Section 1504.1 provides requirements for wind resistance of various roofing assemblies, however no guidance is provided for designing roof gardens and landscaped roofs to withstand wind loads. Roof gardens and landscaped roofs perform in the same manner as ballasted single ply roof assemblies when exposed to wind loads. ANSI/SPRI RP14 is a national consensus standard that has been developed in cooperation with Green Roofs for Healthy Cities with input from roof membrane manufacturers, component suppliers, contractors, green roofing professionals, testing organizations, and consultants. This design standard is much like the ballast design guide for single-ply roofs currently recognized by the IBC (ANSI/SPRI RP4). It provides the user with a series of tables that define requirements based on design wind speed, building height, parapet height and wind exposure. Three design options are provided. These design options vary in their ability to resist wind loads. Design option 1 uses a 10 lbs/ft2 minimum required load of growth media or trays, Design option 2 also requires minimum 10 lbs/ft2 of growth media or trays in the field of the roof and 13 lbs/ft2 of growth media or interlocking trays or 22 lbs/ft2 of individual trays in the corner and perimeter regions. Design option 3, which is designed for high wind load areas, requires 13 lbs/ft2 of growth media or interlocking trays, or 22 lbs/ft2 of individual trays in the field of the roof and does not allow any loose growth media or trays in the perimeter and corner regions. The perimeter of the building is defined as 40% of the building height. Adjustments are provided to increase the wind resistance of the design based on specific building conditions such as the buildings importance factor, large openings in adjacent walls and rooftop projections to name a few. The standard also provides requirements for newly planted garden roofs that do not have fully developed root systems. Fully developed root systems allow the garden roof assembly to perform very well when exposed to high wind situations, however prior to development of the root system special precautions must be taken.

This proposal includes a requirement for special inspection to verify conformance to the ANSI/SPRI RP14 design standard when the system is installed in a high wind region as described in Section 1705.10.

The basis for the standard includes wind tunnel data generated in support of the ballasted single ply design guide. This wind tunnel testing helped develop an understanding of the impact of particle size and parapet height on the performance of ballasted assemblies. It also provided information regarding the weight of ballast required to keep the roof systems in place at various wind speeds. This data, along with 50-years of garden roof performance data from both the US and Europe were used in the development of this standard.

Cost Impact: The code change proposal may increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1504.9 (NEW) #2-S-ENNIS

S19–12
1505.1, 1509.7.2

Proponent: Christine Covington, Solar Energy Industries Association

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER OF THE IBC FIRE SAFETY CODE DVELOPMENT COMMITTEE.

Revise as follows:

1505.1 General. Roof assemblies shall be divided into the classes defined below. Class A, B and C roof assemblies and roof coverings required to be listed by this section shall be tested in accordance with ASTM E 108 or UL 790. In addition, *fire-retardant-treated wood* roof coverings shall be tested in accordance with ASTM D 2898. The minimum roof coverings installed on buildings shall comply with Table 1505.1 based on the type of construction of the building.

Exceptions:

1. Skylights and sloped glazing that comply with Chapter 24 or Section 2610.
2. Rooftop mounted photovoltaic panel systems shall be listed and labeled in accordance with UL 1703 for fire classification. The minimum photovoltaic panel system fire classification listing shall be as required by Table 1505.1 or as otherwise required by this code.

1509.7.2 Fire classification. Rooftop mounted photovoltaic panel systems shall have ~~the same~~ a fire classification as ~~the roof assembly~~ required by Section 1505.

Reason: The current IBC requirement to classify photovoltaic systems consistent with the requirement for roof covering materials does not adequately address fire performance evaluation considerations. Fire testing of rooftop mounted (stand-off, rack-mounted) photovoltaic systems was conducted by the Solar America Board for Codes and Standards in conjunction with Underwriter's Laboratories. Their test results did not confirm that a Class A classified roof combined with a Class A classified photovoltaic module would automatically result in an overall Class A assembly. In some cases, systems would perform better, in many worse. This lack of correlation does not address the overall fire performance concern expressed by ICC members at previous hearings.

The intent of this code change is to control roof surface fire propagation and fire spread from the roof surface to a building's interior.

The UL 1703 Standards Committee has been working on revised roofing classification testing employing a complete system comprised of a representative roof covering combined with the photovoltaic panels/modules being evaluated. This will provide assurance that the roof will be rated as the code intends with the specific panel or module system being used.

For further information on Solar ABC's on-going fire testing, visit http://www.solarabcs.org/current-issues/fire_class_rating.html

The revisions to 1509.7.2 direct the user to 1505 where the roof covering and PV panel testing is located. A new second exception is added to 1505.1 to require that the panel is to be evaluated to UL1703, not UL790 or ASTM E108. The exception's second sentence intends that the Class A, B, or C fire classification listed PV panel/module system be consistent with any other fire classification requirement for the roof covering contained within the IBC. In some cases, the code may restrict the roof classification to a higher category than what is required simply based on type of construction.

Cost Impact: The code change proposal will not increase the cost of construction.

S19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.1-S-COVINGTON

S20–12
1505.2

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER OF THE IBC FIRE SAFETY CODE DVELOPMENT COMMITTEE.

Revise as follows:

1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be *listed* and identified as Class A by an *approved* testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing.
3. Class A roof assemblies include minimum 16 oz/sq. ft. (0.0416 kg/m2) copper sheets installed over combustible decks.
4. <u>Class A roof assemblies include slate installed over ASTM D226, Type II underlayment over combustible decks.</u>

Reason: In IBC 2009, the Exceptions to Section 1505.2 were amended to require ASTM E 108 or UL 790 fire testing to determine the fire classification of certain roof assemblies, including copper sheets and slate, that had historically been exempted for fire testing. At the time, a lack of adequate fire test data was cited as the reason for this change.

In IBC 2012, Exception 3 was added based upon fire testing that was conducted by the Copper Development Association. The National Roofing Contractor Association and the National Slate Association have conducted fire tests at Underwriters Laboratories, Inc. (UL) that documents slate installed over a specific underlayment (ASTM D226, Type II) over a combustible deck meets the requirements of UL 790 Class A. This testing substantiates the addition of Exception 4 as a Class A roof assembly.

A copy of this test report has been submitted with this code change proposal; additional copies are available by contacting the proponent.

Cost Impact: The code change proposal will not increase the cost of construction.

S20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.2-S-GRAHAM

S21–12
1505.8

Proponent: Christine Covington, Solar Energy Industries Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE

Revise as follows:

1505.8 Building integrated photovoltaic systems. Rooftop installed building integrated photovoltaic systems that ~~are adhered or attached to~~ serve as the roof covering ~~or photovoltaic modules/shingles installed as roof coverings~~ shall be listed and labeled ~~to identify their~~ for fire classification in accordance with ~~the testing required in~~ Section 1505.1.

Reason: This section intends to require flush mounted PV roof coverings or PV integrated roof cladding systems to comply with UL790 or ASTM E108. This is appropriate for these types of systems.

The current language used in this section implies that a stand-off rack mounted panel or module system is also required to be evaluated to UL790 or ASTM E108. These types of stand-off systems have differing fire characteristics that are better evaluated using UL1703 method for fire classification. This is currently required under Section 1509.7.2.

The proposed change will clarify which test is appropriate for BIPV systems used in a roofing application.

Cost Impact: The code change proposal will not increase the cost of construction.

S21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.8-S-COVINGTON

S22–12
1505.8 (NEW)

Proponent: David Marsili, City of Las Vegas Fire Rescue, representing self (dmarsili@lasvegasnevada.org)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRESAFETY CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

<u>**1505.8 Roof identification signs.** Identification signs shall be placed at approved locations on the roof of buildings that indicate the roof Fire Classification, Roof Type, Truss Type and the Direction of Construction. The signs are to be a minimum of six inches in height with one inch letters on contrasting background.</u>

Reason: For fire fighter safety during fire emergencies in buildings. Over the past 30 years building construction methods have transformed from heavy timber, larger steel and concrete sections, to smaller, lighter, engineered glue-laminated lumbered beams and trusses. It is now common to find this lightweight steel and engineered wood framing in virtually all structures such as nursing homes, hotels, apartments, schools, daycare centers and strip-malls. With this newer light weight construction of roofs and truss support systems, construction failure and collapse is proven to happen faster under fire conditions than traditional materials, thus it is imperative that any firefighting team assigned to roof ventilation gain this type of construction information of these key elements as soon as possible. This information would be available to fire fighters immediately with small signs placed at proper locations on the roof. This idea was actually called for in a NIOSH released document in April, 2005 called, "*Preventing injuries and death of Fire Fighters due to Truss System Failures.*" One jurisdiction in the State of Florida has already locally adopted a similar signage system to alert their Fire Department of the type of construction used on roof and truss system within the building.

In July 2006, the Occupational Safety and Health Administration published a document for building designers, owners and managers entitled *Fire Service Features of Buildings and Fire Protection Systems.* On page 26 of this document it describes the "*Hazards to the Fire Service"* including Light Weight Construction. It states that many firefighters have been killed in collapses attributed to truss failure particularly those made of wood. In Table 1 of the report, testing was conducted on the Structural Members of trusses to the point of failure. One commonly used truss system made of 6 x 1 ¾ in. C-joist type construction, completely failed in just 3:45 minutes of their testing.

In May 2008, a document published by Fire Engineering entitled *Structural Collapse under Fire Conditions*, goes into get detail of their testing of floor and roof assemblies. They tested commonly used structural assemblies made of wood under actual load bearing circumstances. On page 2 of this document there is a table called "*Lumber Failure Times*". The table shows all I-joist type construction with typical spacing of 24 inches, failed in 4:40 minutes into the test.

Most fire academies across the country teach fire fighters once they are on the roof on buildings, they have five minutes or less to gain the information necessary to ventilate the structure under fire conditions. This typically is done by cutting many small inspection holes into areas of the roof to determine the type of construction used and the direction of construction of the supporting truss system. This code change will give them this information immediately saving them valuable time to do their jobs and possibly save lives.

OSHA-Fire Service Features is available at www.osha.gov/publications/firefeatures3256.pdf

Fire Engineering – Structural Collapse under Fire Conditions is available at www.fireengineering.com/articles/print/volume-161/issue-5.

NIOSH-Preventing Injuries and death of Fire Fighters due to Truss System Failures is available at www.cdc.gov/niosh/docs/wp-solutions/2005-102/pdfs/2005-102.pdf

Example:

Fire Classification: A, B, C or None.

Roof Type: Asphalt shingle over plywood, rubber membrane/foam over metal,etc…

Truss type: Lightweight wood truss, steel web truss, panelized, truss joist, steel bar truss, engineered I-beam, etc.…

Truss Direction: North/South, East/West, Alpha to Bravo, or Charlie to Delta.

(If panelized then state main beam direction)

Cost Impact: The code change will have a very minimal impact on building construction.

S22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.8 (NEW)-S-MARSILI.doc

S23–12
1505.9 (NEW)

Proponent: Tony Crimi, A.C., Consulting Solutions, Inc., representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

1505.9 Roof insulation. Roof insulations for Group H-2, H-3, or H-4 occupancies shall comply with the requirements of Class NC (noncombustible core) in accordance with FM 4470.

Reason: This proposal introduces a new type class of non-combustible roof insulation products which are specifically evaluated for a higher level of resistance to ignition based upon testing and conformance with the newest edition (2009) of FM 4470 Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet,Built-Up Roof (BUR) and Liquid Applied Roof Assemblies. It does not preclude the use of other roof insulation materials. This proposal does not does not preclude the use of other roof insulation materials. It merely recognizes that in order for a roof insulation to be considered non-combustible, it needs to comply with the new FM 4470 standard.

There is a long history of losses connected with fires in roofing materials and roof coverings. According to NFPA statistics, an average of 4,200 fires starting with exterior roof coverings, surfaces or finishes made of sawn wood occurred per year during the five year period from 1994 through 1998. These fires caused an average of five civilian deaths, 23 civilian injuries and an estimated $7.0 million in direct property damage per year. During this time period, these fires accounted for 0.7% of the 567,100 total reported structure fires, 0.1% of the 3,744 civilian structure fire deaths, 0.1% of the 21,293 civilian structure fire injuries, and 1.1% of the $7.2 billion in direct property damage. These totals exclude from the analysis fires where the roof covering was recorded as composed of hardboard, plywood, fiberboard or wood pulp, as these products are considered more likely to refer to decking or framing, rather than to shingles and covering. Also excluded are fires where the roof covering was recorded as growing wood, felled but unsawn wood, wood shavings, or unclassified or unknown-type wood. More importantly, this analysis excludes fires that begin with some other fuel but grow and spread primarily through secondary involvement of wooden roof coverings. Such fires cannot be identified in existing national databases.[1]

The roof insulation is one of the most vulnerable parts of a building. Group H buildings are designed to address hazards beyond the other occupancies to provide minimum regulations intended to mitigate the risk to life and structures.

[1] Marty Ahrens, NFPA Report, Wood Shingle or Wood Shake Roof Fires, Statistical Analysis, July 2001

Cost Impact: The code change proposal will not increase the cost of construction.

ANALYSIS: This code change proposal references FM standard 4470, which is already referenced in this code. However, the proposed change to code text is written to correlate with a new edition of the standard 4470-2009, rather than the edition presently referenced in the code, which is the 1993 edition. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved, the code text will revert to the text as it appears in the 2012 Edition of the Code.

S23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.9 (NEW)-S-CRIMI.doc

S24–12
1505.9 (NEW), Chapter 35 (NEW)

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIR SAFETY CODE DEVELOPMENT COMMITTTEE

Add new text as follows:

1505.9 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1507.16 and shall be installed in accordance with ANSI/SPRI VF-1.

Add new standard to Chapter 35 as follows:

SPRI
VF-1-2010 External Fire Design Standard for Vegetative Roofs

Reason: Section 1507.16 requires that roof gardens and landscaped roofs comply with the requirements of Chapter 15. Section 1505 requires that roofing assemblies be fire classified. The current test procedures used to provide this fire classification are not applicable to garden and landscape roofs due to the many variables (plant types, moisture content, etc.) that exist for these types of systems. ANSI/SPRI VF-1 is a national consensus standard that has been developed in conjunction with Green Roofs for Healthy Cities with input from roof membrane manufacturers, component suppliers, contractors, green roofing professionals, testing organizations, and consultants. This standard provides a design method to assure an acceptable level of performance of roof gardens and landscaped roofs when exposed to exterior fire sources. The general approach used in this standard is to design in fire breaks for large roof areas, around rooftop equipment and penetrations, and next to adjacent walls. Some of the specific requirements are:

- Exposed membrane areas must conform to the designed fire resistance requirements as determined by the authority having jurisdiction.
- For all vegetated roofing systems abutting combustible vertical surfaces, a Class A (per ASTM E108 or UL790) rated assembly must be achieved for a minimum 6 ft (1.83 m) wide continuous border placed around rooftop structures and all rooftop equipment.

For large roof areas: Partition the roof area into sections not exceeding 15,625 ft2 (1,450 m^2), with each section having no dimension greater than 125 ft (39 m) by installing a a minimum of 3ft. (0.9 m) wide, Class A rated assembly barrier zones.

Cost Impact: The code change proposal may increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1505.9-S-ENNIS.doc

S25–12
1506.1

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1506.1 Scope. The requirements set forth in this section shall apply to the application of roof-covering materials specified herein. Roof coverings shall be applied in accordance with this chapter and the manufacturer's <u>printed</u> installation instructions. Installation of roof coverings shall comply with the applicable provisions of Section 1507.

Reason: This code change proposal clarifies the intent of the code by specifically stipulating manufacturers' installation instructions need to be in print. Other forms of instructions, such as verbal statements, are not appropriate for code compliance purposes.

Cost Impact: The code change proposal will not increase the cost of construction.

S25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1506.1-S-GRAHAM

S26–12
1506.2

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Delete without substitution:

~~**1506.2 Compatibility of materials.** Roofs and roof coverings shall be of materials that are compatible with each other and with the building or structure to which the materials are applied.~~

Reason: This code change proposal is intended to facilitate better compliance and easier enforcement of the Code relating to roof coverings.

Specific criteria are not provided in the Code for determining roofing materials' compatibility or incompatibility. Material compatibility is best determined by material manufacturers and should be explained or restricted in manufacturers' installation instructions, which are already provided for in Section 1506.1-Scope.

Deleting this section relieves the building official for making determinations of materials' compatibility or incompatibility without specific criteria.

Cost Impact: The code change proposal will not increase the cost of construction.

S26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1506.2-S-GRAHAM

S27–12
1506.3

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1506.3 Material specifications and physical characteristics. Roof-covering materials shall conform to the applicable standards *listed* in this chapter. In the absence of applicable standards or where materials are of questionable suitability, ~~testing by an *approved* agency shall be required by the *building code official* to determine the character, quality and limitations of application of~~ the materials shall be *approved* by the *building official* in accordance with Section 104.11.

Reason: This code change proposal is intended to clarify the code's intent relating to the use of roofing materials that do not specifically conform to the requirements of this Chapter.

It can be interpreted that Section 1506.3 may conflict somewhat with Section 104.11-Alternative Materials, Design and Methods of Construction and Equipment. The proposal clarifies the Code's language and provides a direct reference to Section 104.11

Cost Impact: The code change proposal will not increase the cost of construction.

S27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1506.3-S-GRAHAM

S28–12
1507.10.3 (NEW)

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Add new text as follows:

1507.10.3 Mopping asphalt. Asphalt used in the field application of hot-applied built-up roofs shall comply with ASTM D312 and have a minimum 125°F (69.4°C) temperature differential between the asphalt's equiviscous temperature and its flash point temperature. Asphalt shall not be heated to or above its flash point temperature.

Reason: This code change proposal is intended to add requirements to the Code to provide for the safe and proper installation of hot-applied built-up roofs.

The application of most built-up roofs involves heating asphalt at the jobsite, typically in either an asphalt kettle or asphalt tanker located at ground level, to temperatures in excess of 500 °F (260°C) in order to dispense the asphalt at the point of application (rooftop) at an adequate temperature for proper application. The material standard for roofing asphalt--ASTM D312, which is already referenced in the Code--provides for the testing and labeling of asphalt's maximum heating temperature (flash point temperature) and proper application temperature (equiviscous temperature).

In order to minimize the risks of fires associated with jobsite heating of asphalt, an asphalt should not be heated to its flash point temperature. To allow for the proper application of mopping asphalt, a temperature differential between the asphalt's heating temperature and its equiviscous temperature is necessary to account for the asphalt's cooling during transportation from the heating location (e.g., ground level) and the point of applcaition (rooftop). *The NRCA Roofing Manual* suggests a minimum 125°F (69.4°C) differential between an asphalt's equiviscous temperature and it's flash point temperature for this purpose.

This code change proposal establishes a minimum temperature differential between and asphalt's equiviscous temperature and it's flash point temperature, and stipulates asphalt shall not be heated to or above its flash point temperature.

Cost Impact: The code change proposal will not increase the cost of construction.

S28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.10.3 (NEW)-S-GRAHAM

S29–12

1507.2 (NEW), 1507.2.1 (NEW), 1507.2.2 (NEW), 1507.2.3 (NEW), 1507.2.8.1, 1507.3.3.3, 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1, Chapter 35

Proponent: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (IBHS)

Revise as follows:

1507.2. Sealed roof decks. When required, a sealed roof deck shall be installed in accordance with Section 1507.2.1, 1507.2.2 or 1507.2.3.

1507.2.1 Self-adhering cap sheet. The entire roof deck shall be covered with a self adhering polymer modified bitumen membrane complying with ASTM D 1970. An approved underlayment for the applicable roof covering shall be applied over the cap sheet, unless the top surface of the membrane provides a bond break between the membrane and the roof covering.

1507.2.2 Self-adhering strips. A minimum 4 inch wide strip of self adhering polymer modified bitumen membrane complying with ASTM D 1970 shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering shall be applied.

1507.2.3 Synthetic underlayment. The roof deck shall be covered with a reinforced synthetic roof underlayment approved as an alternate to ASTM D 226 Type I or II. The synthetic underlayment shall have a minimum tear strength of 20 lbs in accordance with ASTM D 1970 or ASTM D 4533. This underlayment shall be attached using annular ring or deformed shank roofing fasteners with minimum 1 inch diameter caps at 6 inches on center spacing along all laps and at 12" on center in the field or a more stringent fastener schedule if required by the manufacturer for high wind installations. Metal caps are required for areas where the V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 110 mph. Side laps shall be a minimum of 2 inches and end laps shall be a minimum of 6 inches. All seams shall be sealed with a compatible adhesive or a compatible 4 inch wide tape. For roofs with slopes of 45 degrees and higher, seams are not required to be sealed provided laps are a minimum of 18 inches. No additional underlayment is required.

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.3.3.3 High wind attachment. Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32- gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed roof deck installed in accordance with Section 1507.2 shall be permitted.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, ~~adhered underlayment complying with ASTM D 1970~~ a sealed rood deck installed in accordance with Section 1507.2 shall be permitted.

Add new standard to Chapter 35 as follows:

ASTM

D 4533-11 Standard Test Method for Trapezoid Tearing Strength of Geotextiles

Reason: This code change proposal simply seeks to expand and provide additional specification for using self-adhering polymer modified bitumen membrane to prevent water intrusion. The commonly used term "secondary water barrier" is no longer used, since some have argued that underlayment itself is a secondary water barrier. Secondary water barrier has been replaced by the term "sealed roof deck." Regardless of the terminology, the purpose of these provisions is provide an additional level of protection to the roof decking in the event that the primary roof covering is blown off due to high winds. It's important to note that this code change proposal does not require a sealed roof deck. Rather, it provides specific criteria for creating a sealed roof deck as an alternative to the requirements for underlayment in high winds (e.g., Section 1507.2.8.1). While providing specific installation criteria for the bitumen membrane, this code change proposal also incorporates the use of reinforced synthetic underlayment for creating a sealed roof deck. The criteria specified are consistent with the IBHS Fortified program requirements for creating a sealed roof deck.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2 (NEW)-S-STAFFORD

S30–12
1507.2.1

Proponent: Eli P. Howard III, Sheet Metal and Air-Conditioning Contractors' National Association (SMACNA) (ehoward@smacna.org)

Revise as follows:

1507.2.1 Deck requirements. Asphalt shingles shall be fastened to solidly sheathed decks. <u>Installer is required to remove the cover strip protecting adhering tabs.</u>

Reason: Often roofing contractor employees install asphalt shingles without removing the protective strip from underneath that separates shingles and the adhesive from other shingles during storage and shipment. As the code is currently written, this is not a requirement. This code change simply adds this commonsense step into the code and provides the code inspector the ability to enforce the practice.

Cost Impact: The code change proposal will not increase the cost of construction.

S30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.1-S-HOWARD

S31–12

1507.2.6.1 (NEW), 1507.2.8.1, 1507.3.3.3, 1507.3.6.1 (NEW), 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1

Proponent: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (IBHS)

Revise as follows:

1507.2.6.1 Fasteners and high winds. In areas where the ultimate design wind speed, V_{ult} equals or exceeds 130 mph, fasteners for asphalt shingles shall be annular ring shank nails having not less than 20 rings per inch in addition to the requirements of Section 1507.2.6.

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equals to or greater than 130 mph, shall be applied with corrosion-resistant fasteners complying with Section 1507.2.6.1 in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design wind speed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a ~~head~~ cap diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall comply with Section 1507.2.6.1 and shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.3.3.3 High wind attachment. Underlayment applied in areas subject to high wind ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal or greater than 130 mph] shall be applied with minimum 12 gage [0.105 inch (2.67 mm) corrosion-resistant ~~fasteners in accordance with the manufacturer's installation instructions~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design wind speed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

> **Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.3.6.1 Fasteners and high winds. In areas where the ultimate design wind speed, V_{ult} equals or exceeds 130 mph, fasteners for tile shall be a minimum 11 gage [0.105 inch (2.67 mm)] annular ring shank nails having not less than 20 rings per inch shank, with a minimum 5/16 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal to or greater than 130 mph] shall be applied with minimum 12 gage [0.105 inch (2.67 mm) corrosion-resistant ~~fasteners in accordance with the manufacturer's installation instructions.~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design wind speed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

> **Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal to or greater than 130 mph shall be applied with minimum 12 page [0.105 inch (2.67 mm) corrosion-resistant ~~fasteners in accordance with the manufacturer's installation instructions~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1~~ the ultimate design wind speed, V_{ult}, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a ~~head~~ cap diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.~~

> **Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal to or greater than 130 mph] shall be applied with minimum 12 gage [0.105 inch (2.67 mm) corrosion resistant ~~fasteners in accordance with the manufacturer's installation instructions.~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3./8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design winds peed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a ~~head~~ cap diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal to or greater than 130 mph] shall be applied with minimum 12 gage [0.105 inch (2.67 mm) corrosion resistant ~~fasteners in accordance with the manufacturer's installation instructions.~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design wind speed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a ~~head~~ cap diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal to or greater than 130 mph shall be applied with minimum 12 gage [0.105 inch (2.67 mm) corrosion resistant fasteners ~~in accordance with the manufacturer's installation instructions.~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design wind speed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a ~~head~~ cap diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.~~

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds ~~[V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1]~~ [V_{ult} equal to or greater than 130 mph] shall be applied with minimum 12 gage [0.105 inch (2.67 mm) corrosion resistant ~~fasteners in accordance with the manufacturer's installation instructions.~~ annular ring shank nails having not less than 20 rings per inch, with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where ~~V_{asd}, in accordance with Section 1609.3.1,~~ the ultimate design wind speed, V_{ult} equals or exceeds ~~120~~ 140 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a ~~head~~ cap diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.~~

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

Reason: Water intrusion continues to be an issue with hurricanes and high wind events. Significant improvements have been made recently to the codes and other voluntary methods that help prevent water intrusion through the roof decking when the primary roof covering has been blown off or damaged. These include the underlayment and high wind requirements in the 2012 IBC and the 2012 IRC in addition to the Sealed Roof Deck provisions recommended by the IBHS Fortified program and FEMA hurricane retrofit program guidance. However, recent tests on sealed roof decks at the IBHS Research Center indicate that water intrusion through nail holes left in the roof decking when the primary roof covering has been lost is still an issue. In the areas specified, this code change proposal requires the roof underlayment to be attached with ring shank nails. Where nails are specified for the roof covering attachment, this code change proposal requires the use of ring shank nails. Ring shank nails have a significantly higher withdrawal capacity to similar sized smooth shank nails (up to 131% higher). The use of ring shank nails will help keep the nails in place when the roof covering is blow off and reduce the chance that unfilled nail holes will allow water intrusion.

This code change proposal also changes the wind speed trigger for when the improved underlayment and fastening methods are required. The wind speed is changed to a V_{ult} value consistent with the wind speeds represented in Figures 1609A, 1609B, and 1609C. Additionally, the wind speed threshold that triggers the improved underlayment and fastening methods has been slightly reduced. The proposed 130 mph and 140 mph V_{ult} wind speed triggers are more comparable geographically to the 110 mph and 120 mph wind speeds in the 2009 IBC. The triggers are also consistent with the wind speed limitations on conventional construction and the prescriptive non-high wind provisions of the 2012 IRC (The Wind Design Required Region in the 2012 IRC is tied to the 130 mph V_{ult} wind speed). Post-storm investigations also show that water intrusion is an issue in inland areas when the primary roof covering has been blown off.

Cost Impact: The code change proposal will increase the cost of construction.

S31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.6.1 (NEW)-S-STAFFORD

S32–12

1507.2.7.1, Table 1507.2.7.1(1), Table 1507.2.7.1(2),

Proponent: Michael D. Fischer, Kellen Company, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Revise as follows:

1507.2.7.1 Wind resistance. Asphalt shingles shall be tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table ~~1507.2.7.1(1)~~ 1507.2.7.1 for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table ~~1507.2.7.1(1).~~ 1507.2.7.1.

> **Exception:** Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table ~~1507.2.7.1(2).~~ 1507.2.7.1.

~~**TABLE 1507.2.7.1(1)**~~
~~**CLASSIFICATION OF ASPHALT**~~
~~**ROOF SHINGLES PER ASTM D 7158**~~[a]

~~**NOMINAL DESIGN WIND SPEED, V_{asd}**~~[b] ~~**(mph)**~~	~~**CLASSIFICATION REQUIREMENT**~~
~~85~~	~~D, G or H~~
~~90~~	~~D, G or H~~
~~100~~	~~G or H~~
~~110~~	~~G or H~~
~~120~~	~~G or H~~
~~130~~	~~H~~
~~140~~	~~H~~
~~150~~	~~H~~

~~For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.~~

~~a. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.~~

~~b. V_{asd} shall be determined in accordance with Section 1609.3~~

~~**TABLE 1507.2.7.1(2)**~~
~~**CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161**~~

~~**NOMINAL DESIGN WIND SPEED, V_{asd}**~~[a] ~~**(mph)**~~	~~**CLASSIFICATION REQUIREMENT**~~
~~85~~	~~A, D or F~~
~~90~~	~~A, D or F~~
~~100~~	~~A, D or F~~
~~110~~	~~F~~
~~120~~	~~F~~
~~130~~	~~F~~
~~140~~	~~F~~
~~150~~	~~F~~

~~For SI: 1 mph = 0.447 m/s.~~

~~a. V_{asd} shall be determined in accordance with Section 1609.3.1.~~

TABLE 1507.2.7.1
CLASSIFICATION OF ASPHALT SHINGLES

Maximum Basic Wind Speed, V_{ult} from Figure 1609A, B, C or ASCE-7	**Maximum Basic Wind Speed, V_{asd} from Table 1609.3.1**	**ASTM D 7158[a] Shingle Classification**	**ASTM D 3161 Shingle Classification**
110	85	D, G or H	A, D or F
116	90	D, G or H	A, D or F
129	100	G or H	A, D or F
142	110	G or H	F
155	120	G or H	F
168	130	H	F
181	140	H	F
194	150	H	F

For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.
a. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

Reason: With the introduction of the updated ASCE-7 into the IBC, there is a disconnect between the referenced standards for the wind resistance of asphalt shingles and the revised wind speed maps in the code. The proposal is based on revisions to the Florida Building Code and will provide for a simpler process for code officials to verify the appropriate selection of asphalt shingles. This is necessary to eliminate confusion in the marketplace caused by the change in how wind speeds are characterized.

Cost Impact: The code change proposal will not increase the cost of construction.

S32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.7.1-S-FISCHER

S33–12
1507.2.8.2

Proponent: Bill McHugh, Chicago Roofing Contractors Association (bill@crca.org)

Revise as follows:

1507.2.8.2 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the *exterior wall* line of the building.

Exceptions:

1. Detached accessory structures that contain no conditioned floor area.
2. Roofs with slope equal to or greater than 8/12, the ice barrier shall be applied to a point 36 inches (914 mm) past the outside part of the inside wall line of the building up the slope of the roof deck.

Reason: The Chicago Roofing Contractors Association (CRCA) and other steep slope roofing contractors work in all climates from hot summer to the dead of cold, snowy winters. We have enough snow most years to get much experience in ice dam situations.

In steep slope applications in climates where ice forms at the eave edge of roofs. Ice melts due to heat from below melting snow, then freezes where the water meets roof surfaces that are over unheated areas, making a buildup of ice. This buildup becomes a 'dam' that backs water up under the roof covering and underlayment leaking into the building.

The purpose of this proposal is to bring to the Code into alignment with the practical application of the ice barrier underlayment products in the field. Since gravity stops water from backing up very far on super steep slopes greater than 8" in 12" there needs to be a limit to the amount of ice barrier underlayment applied.

On very steep sloped roofs, the ice dams will still occur. However, buildup of ice cannot build far beyond the ball that forms at the gutter edge on slopes greater than 8" in 12". Secondly, the water will not defy gravity and move very far upward, when the physics of the application are that the water will drip over the dam due to gravity first.

The way the current code is written, ice barrier material may be needed on the complete roof deck rather than to protect just the eave edges and 3' up slope. Through clarifying this requirement with the exception, the intent of the code is met while reducing costs to builders and building owners and managers.

Cost Impact: The code change proposal will not increase the cost of construction.

S33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.8.2 #1-S-MCHUGH

S34–12
1507.2.8.2

Proponent: Bill McHugh, Chicago Roofing Contractors Association (bill@crca.org)

Revise as follows:

1507.2.8.2 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend 2 inches (51 mm) down the fascia and under the drip edge, from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the *exterior wall* line of the building.

Exceptions:

1. Detached accessory structures that contain no conditioned floor area.
2. Roof recover applications where no new metal drip edges or gutters are incorporated.

Reason: The Chicago Roofing Contractors Association (CRCA) and other steep slope roofing contractors work in all climates from hot summer to the dead of cold, snowy winters. We have enough snow most years to get much experience in ice dam situations.

In steep slope applications in climates where ice forms at the eave edge of roofs. Ice melts due to heat from below melting snow, then freezes where the water meets roof surfaces that are over unheated areas, making a buildup of ice. This buildup becomes a 'dam' that backs water up under the underlayment and roof covering.

Studies show that roof recover applications typically fail at flashings on all roof slopes. The roof edge flashings are most susceptible to leaks from water backing up under the underlayment and roof covering because it freezes at the eave edge first driving water up-slope.

According to CRCA roofing contractors, if the code required ice barrier is applied improperly to the top of the metal drip edge, the water will leak into the structure. The leak(s) may be difficult to detect in the concealed space location.

In new construction, tear off and roof replacement situations the roofing underlayment construction is easily phased to be installed before the drip edges at the eave edge.

In roof recover applications where metal is not removed, surfaces may be dirty, uneven, and very difficult even for the best contractors to provide a water tight seal.

To provide the building owner the best application and give the code requirement the best chance at working as intended, this proposal from the Chicago Roofing Contractors Association is presented.

Cost Impact: The code change proposal will not increase the cost of construction.

S34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.8.2 #2-S-MCHUGH

S35–12
1507.2.8.2

Proponent: Bill McHugh, Chicago Roofing Contractors Association (bill@crca.org)

Revise as follows:

1507.2.8.2 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of ~~at least two layers of underlayment cemented together or of~~ a self adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the *exterior wall* line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

Reason: In a survey of CRCA Steep & Shingle Committee Members it appears this method for ice barrier protection is no longer used due to labor intensive and messy application.

At the time the ice barrier materials were introduced to the code, this was an application used because the ice barrier materials were not in the code. After years of use, it seems the two layers of underlayment cemented together method is not used as it is much more costly than the self adhering polymer modified bitumen sheet materials.

Therefore, we propose to remove this option from the code.

Cost Impact: The code change proposal will not increase the cost of construction.

S35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.8.2 #3-S-MCHUGH

S36–12
1507.2.9.3

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

Revise as follows:

1507.2.9.3 Drip edge. ~~Provide~~ A drip edge shall be provided at eaves and ~~gables~~ rake edges of shingle roofs. ~~Overlap to be~~ Adjacent segments of drip edge shall be lapped a minimum of 2 inches (51 mm). ~~Eave~~ The vertical leg of drip edges shall be a minimum of 1-1/2 inches (38 mm) in width, extend a minimum of 1/4 inch (6.4 mm) below sheathing ~~and~~ ,and have a minimum clearance of 3/8" (9.5 mm) from the face of the structure. The drip edge shall extend back on the roof a minimum of 2 inches (51 mm). Underlayment shall be installed over drip edges along eaves. Drip edges shall be installed over underlayment along rake edges. Drip edges shall be mechanically fastened a maximum of 12 inches (305 mm) o.c. Unless specified differently by the shingle manufacturer, shingles are permitted to be flush with the drip edge.

Reason: The purpose of this code change is to revise the IBC drip edge language. The current language is not in proper code format (instructive rather than mandatory) and omits a number of important details necessary for drip edges to function. Notably, the placement of the drip edge relative to the underlayment along eaves and rake edges is critical and differs for each location. Along eaves, the underlayment should be installed on top of the drip edge so that moisture migrating down the roof passes over both the underlayment and drip edge and into the gutter. Along rake edges, the drip edge should be installed over the underlayment to prevent wind-blown moisture from getting below the underlayment. Most of these changes correlate with the language approved last cycle in Section R905.2.8.5 of the IRC. The one provision not appearing in the IRC is the minimum 3/8" clearance from the face of structure. This requirement appears in ICC 600 Section 502.4.2 and gives additional protection to the fascia board or other facing materials overlapped by the vertical leg of the drip edge.

Cost Impact: The code change proposal will not increase the cost of construction.

S36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.2.9.3-S-EHRLICH

S37–12

1507.2.8.1, Table 1507.2.8.1 (NEW), 1507.3.3.3, 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1

Proponent: John Kurtz, International Staple, Nail & Tool Association (isanta@ameritech.net)

Revise as follows:

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exceptions:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.

TABLE 1507.2.8.1
ROOF COVERING UNDERLAYMENT ATTACHMENT

Alternate Fastener [a]	Maximum center-to-center spacing of alternate fasteners and grid lines if required center-to-center spacing of code fastener is	
	6” (152 mm) o.c.	12” (305 mm) o.c.
5/8” leg, 21 gage staple	3” (76 mm)	6” (152 mm)
21 gage staple	3” (76 mm)	7” (178 mm)
20 gage staple	4” (102 mm)	8” (203 mm)
0.080 -.083 diam. nail	4” (102 mm)	9” (229 mm)
0.090 diam. Nail 18 gage staple	5” (127 mm)	10” (254 mm)
0.105 diam. Nail (12 gage) 17 gage staple 0.120 diam. nail (11 gage)	6” (152 mm)	12” (305 mm)

a. Minimum nail shank length or staple leg length is 3/4” (19 mm) unless otherwise stated.

1507.3.3.3 High wind attachment. Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer’s installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where $V_{asd,}$ in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exception<u>s</u>:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. <u>As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.</u>

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exception<u>s</u>:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. <u>As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.</u>

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

Exception<u>s</u>:

<u>1.</u> As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
<u>2.</u> <u>As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.</u>

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32- gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exceptions:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exceptions:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

Exceptions:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where $V_{asd,}$ in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

Exceptions:

1. As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
2. As an alternative, cap nails and cap staples complying with requirements of ASTM F1667 and fastened in accordance with Table 1507.2.8.1 shall be permitted.

Reason: The fastener listed for attachment of roof covering underlayment in high-wind areas does not reflect commercially available fasteners successfully used in roofing material application. The code presently lists only one nail shank diameter, 0.105". This proposal addresses both commercially available hand-driven and power-driven cap-fasteners.

Tighter spacing of fasteners specified in the proposed table ensures that spacing of fasteners with diameters not currently specified in the Code would achieve equal (or greater) withdrawal strength than the currently listed nail diameter. Sufficient fastener withdrawal ensures that fastener shanks remain in roof deck while cap transfers uplift forces to the deck. This is a conservative approach because developing data indicates that the relevant failure mode is cap pulling through underlayment, rather than fastener shank withdrawal.

ASTM F1667-11a controls fastener nominal dimensions and tolerances as well as relevant fastener features. Structure of proposal minimizes complexity of code requirements. An "Exception" is added to each roof covering's section. One table presents fastener spacing for all roof coverings.

Cost Impact: The code change proposal will not increase the cost of construction. The numerous options would allow contractors to select options which provide equivalent protection with minimized material and labor costs.

S37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1507.2.8.1(NEW)-S-KURTZ.doc

S38–12
1507.4.4

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1507.4.4 Attachment. Metal roof panels shall be secured to the supports in accordance with the *approved* manufacturer's fasteners. In the absence of manufacturer recommendations, the following fasteners shall be used:

1. Galvanized fasteners shall be used for steel roofs.
2. Copper, brass, bronze, copper alloy or 300 series stainless-steel fasteners shall be used for copper roofs.
3. Stainless-steel fasteners are acceptable for all types of metal roofs.
4. Aluminum fasteners are acceptable for aluminum roofs attached to aluminum supports.

Reason: New language provides acceptable construction methods for aluminum-only roof systems.

Cost Impact: The code change proposal will not increase the cost of construction.

S38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.4.4-S-MANLEY

S39–12
Table 1507.4.3(1)

Proponent: Eli P. Howard III, Sheet Metal and Air-Conditioning Contractors' Association (SMACNA) (ehoward@smacna.org)

Revise as follows:

TABLE 1507.4.3(1)
METAL ROOF COVERINGS

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
Aluminum	ASTM B 209, 0.024 inch minimum thickness for roll-formed panels and 0.019 inch minimum thickness for press-formed shingles.
Aluminum-zinc alloy coated steel	ASTM A 792 AZ 50, 0.024 inch minimum thickness for roll-formed panels.
Cold-rolled copper	ASTM B 370 minimum 16 oz./sq. ft. and 12 oz./sq. ft. high yield copper for metal-sheet roof covering systems: 12 oz./sq. ft. for preformed metal shingle systems.
Copper	16 oz./sq. ft. for metal-sheet roof-covering systems; 12 oz./sq. ft. for preformed metal shingle systems.
Galvanized steel	ASTM A 653 G-90 zinc-coated[a], 0.024 inch minimum thickness for roll-formed panels.
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B 101 16 oz/sq. ft minimum thickness for roll-formed panels
Prepainted steel	ASTM A 755, 0.024 inch minimum thickness for roll-formed panels.
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A 240, 300 Series Alloys, 0.015 inch minimum thickness for roll-formed panels.
Steel	ASTM A 924, 0.024 inch minimum thickness for roll-formed panels.
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.0026 kg/m2,
1 pound per square foot = 4.882 kg/m2,
1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A 653 galvanized steel roofing shall be G-60.

Reason: There are no required material thicknesses for roof panels of six listed materials while others do have a required thickness. This will place a minimum required thickness for all metal roof panels. These thicknesses are taken from Table 6-1 of SMACNA's Architectural Sheet Metal Manual which has been referenced by thousands of architects on millions of buildings.

Cost Impact: Indeterminate since no requirement is currently present.

S39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1507.4.3(1)-S-HOWARD.doc

S40–12
1507.7.3

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1507.7.3 Underlayment. Underlayment shall comply with ASTM D 226, Type ~~I~~ <u>II</u> or ASTM D 4869<u>, Type III or Type IV</u>.

Reason: This code change proposal is intended to update the Code's minimum requirement for underlayment used with slate roof systems.

Both *The NRCA Roofing Manual* and the National Slate Association's *Slate Roofs Design and Installation Manual* recommend a minimum No. 30 underlayment be used for slate roof systems. A No. 30 designation is consistent with underlayment products designated ASTM D226, Type II or ASTM D4869, Type III or Type IV. Use of these Type classes in the Code is necessary to differentiate to the products from lighter-weight No. 15 underlayment products.

Cost Impact: The code change proposal will not increase the cost of construction.

S40-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.7.3-S-GRAHAM

S41–12
1507.8, Table 1507.8, 1507.9

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1507.8 Wood shingles. The installation of wood shingles shall comply with the provisions of Sections ~~and Table 1507.8~~ 1507.8.1 and 1507.8.2.

~~TABLE 1507.8~~
~~WOOD SHINGLE AND SHAKE INSTALLATION~~

1507.9 Wood shakes. The installation of wood shakes shall comply with the provisions of Sections ~~and Table 1507.8~~ 1507.8.1 and 1507.8.2

Reason: This code change proposal is intended to rectify conflicts that have resulted in the Code regarding wood shingle and wood shake roof systems.

In the final stages of development of the IBC, Table 1507.8-Wood Shingle and Shake Installation was added as a summary of the installation specific requirements of Section 1507.8-Wood Shingles and Section 1507.9-Wood Shakes. With the IBC's 2000 Edition, the requirements in Table 1507.8 matched those of Section 1507.8 and Section 1507.9.

With the publication of IBC's 2003, 2006, 2009 and 2012 editions, changes have been made to the requirements in Section 1507.8 and Section 1507.9; however, these same changes have not been consistently made to Table 1507.8. For example, in IBC 2012 new requirements for underlayment in high wind regions were added in Section 1507.8.3.1 and Section 1507.9.3.1; these requirements were not added to Table 1507.8. There are a number of other similar examples. As a result, the requirements of Table 1507.8 are inconsistent and at times in conflict with those of Section 1507.8 and Section 1507.9.

Deletion of Table 1507.8 and the pointers of the table in Section 1507.8 and Section 1507.9 eliminates the inconsistency and conflicts.

Cost Impact: The code change proposal will not increase the cost of construction.

S41-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.8-S-GRAHAM

S42–12
1507.12.1, 1507.13.1

Proponent: David R. Scott, AIA, Target Corporation (david.scott@target.com)

Revise as follows:

1507.12.1 Slope. Thermoset single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

> **Exception:** Thermoset single-ply membrane roofs designed for water accumulation in accordance with Section 1611.2 shall have a design slope of a minimum of one-eighths unit vertical in 12 units horizontal (1-percent slope).

1507.13.1 Slope. Thermoplastic single-ply membrane roofs shall have a design slope of a minimum of one fourth unit vertical in 12 units horizontal (2-percent slope).

> **Exception:** Thermoplastic single-ply membrane roofs designed for water accumulation in accordance with Section 1611.2 shall have a design slope of a minimum of one-eighths unit vertical in 12 units horizontal (1-percent slope).

Reason: The designer should have the option if designing for ponding instability per 1611.2, to use a lower roof slope such as 1/8" per foot. In addition, the IPC allows the option for pipe to slope at 1/8" per foot.

Cost Impact: The code change proposal will not increase the cost of construction.

S42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.12.1-S-SCOTT

S43–12
1507.12.3, 1507.13.3, Chapter 35 (NEW)

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1507.12.3 Ballasted thermoset low-slope roofs. Ballasted thermoset low-slope roofs (roof slope < 2:12) shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D 448 <u>or ASTM D 7655</u>.

1507.13.3 Ballasted thermoplastic low-slope roofs. Ballasted thermoplastic low-slope roofs (roof slope < 2:12) shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D448 <u>or ASTM D 7655</u>.

Add new standard to Chapter 35 as follows:

ASTM

<u>D 7655-12 Standard Classification for Size of Aggregate Used as Ballast for Roof Membrane Systems</u>

Reason: This code change proposal is intended to add a new recognized standard to the Code for the size classification of aggregate used as ballast for membrane roof systems.
ASTM D 7655, “Standard Classification for Size of Aggregate Used as Ballast for Membrane Roof Systems,” has just been published in 2012 and provides a method for the definition of sizes of aggregate used as ballast for membrane roof systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S43-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.12.3-S-GRAHAM

S44–12
1507.16, Chapter 35 (NEW)

Proponent: Robert J. Davidson, Davidson Code Concepts, LLC, representing Single Ply Roofing Industry (SPRI) (rjd@davidsoncodeconcepts.com)

Revise as follows:

1507.16 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with the requirements of this chapter and Sections 1607.12.3 and 1607.12.3.1 and the *International Fire Code* and ANSI/SPRI VF-1.

Add new standard to Chapter 35 as follows:

ANSI

ANSI/SPRI VF-1-2010 External Fire Design Standard for Vegetative Roofs

Reason: In developing the “Roof gardens and landscaped roofs” requirements that were placed within the International Fire Code, the standard “ANSI/SPRI VF-1” was utilized for the technical installation requirements.

There are approximately 19 states that adopt a fire code other than the IFC and in the process for some of those states linkage is lost to the specific requirements in the IFC that are meant to complement and add to the IBC language, in this case for the rooftop gardens and landscaped roofs. This proposal recommends that a reference to ANSI/SPRI VF-1 be added to the IBC Section 1507.16. This reference would complement the language in the IFC and ensure that the same requirements are available to the code official and apply regardless of what fire code is adopted in a given jurisdiction.

Cost Impact: The code change proposal will not increase the cost of construction.

S44-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.16-S-DAVIDSON

S45–12
1507.17.1, Chapter 35 (NEW)

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1507.17.1 Material standards. Photovoltaic modules/shingles shall be listed and labeled in accordance with ICC-ES AC365 and UL 1703.

Add new standard to Chapter 35 as follows:

ICC ES ICC Evaluation Service
5360 Workman Mill Rd
Whittier, California 90601

AC365-Acceptance Criteria for Building-Integrated Photovoltaic (BIPV) Roof Covering Systems

Reason: This code change proposal is intended to add specific product performance requirements to the IBC for photovoltaic shingles.

UL 1703, "Flat-Plate Photovoltaic Modules and Panels," that is currently referenced in the IBC, addresses the construction, performance (e.g., voltage, current and power requirements test), and wind and fire classification of flat-plate photovoltaic modules. Performance attributes for the products performance as a roof covering (e.g., water-shedding capacity, durability) are not addressed in UL 1703.

The addition of ICC ES AC 365 adds specific product roof covering performance requirements—such as wind-driven rain and product durability—for photovoltaic shingles that are critical for assessing product's long-term performance as a roof covering component.

Currently, a roofing product standard (e.g., ASTM) for photovoltaic shingles does not exist in the industry, making the use of the ICC EC acceptance criteria necessary.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S45-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.17.1-S-GRAHAM

S47–12

1507.17.1 (NEW), 1507.17.2 (NEW), 1507.17.3 (NEW), 1507.17.4 (NEW), 1507.17.4.1 (NEW), 1507.17.4.2 (NEW), 1507.17.5 (NEW)

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Add new text as follows:

1507.17.1 Deck requirements. Photovoltaic shingles shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied over spaced sheathing.

1507.17.2 Deck slope. Photovoltaic shingles shall not be installed on roof slopes less than three units vertical in 12 units horizontal (25-percent slope).

1507.17.3 Underlayment. Unless otherwise noted, required underlayment shall conform to ASTM D 226, ASTM D 4869, or ASTM D 6757.

1507.17.4 Underlayment application. Underlayment shall be applied shingle fashion, parallel to and starting from the eave, lapped 2 inches (51 mm) and fastened sufficiently to hold in place.

1507.17.4.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center. Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.17.4.2 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self adhering polymer modified bitumen sheet shall be used instead of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the *exterior wall* line of the building.

> **Exception:** Detached accessory structures that contain no conditioned floor area.

1507.17.5 Fasteners. Fasteners for photovoltaic shingles shall be galvanized, stainless steel, aluminum or copper roofing nails, minimum 12 gage [0.105 inch (2.67 mm)] shank with a minimum 3/8 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing materials and a minimum of 3/4 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch (19.1 mm) thick, the nails shall penetrate through the sheathing. Fasteners shall comply with ASTM F 1667.

Reason: This code change proposal adds specific requirements for roof decks, roof deck slope, underlayment, underlayment application, underlayment attachment in high wind regions, ice barrier and fasteners to Section 1507.17 on photovoltaic shingles.

The specific requirements being added are consistent with similar attributes for other steep-slope, shingle-type roof coverings. For example, the added Section 1507.17.1 and Section 1507.7.2 are adapted from Section 1507.5.1 and Section 1507.5.2, respectively. Section 1507.3 and Section 1507.4 are adapted from Section 1507.2.3 and Section 1507.2.8, respectively. Section 1507.17.5 is adapted from Section 1507.2.6

Cost Impact: The code change proposal will not increase the cost of construction.

S47-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.17.1 (NEW)-S-GRAHAM

S46–12
202, 1505.8, 1507.17, 1507.17.1, 1507.17.2, 1507.17.3,

Proponent: Lorraine Ross, Intech Consulting Inc., representing The Dow Chemical Company

Revise as follows:

1505.8 Photovoltaic systems. Rooftop installed photovoltaic systems that are adhered or attached to the roof covering or ~~photovoltaic modules~~ BIPV/shingles installed as roof coverings shall be labeled to identify their fire classification in accordance with the testing required in Section 1505.1.

1507.17 ~~Photovoltaic modules~~ BIPV/shingles. The installation of ~~photovoltaic modules~~ BIPV/shingles shall comply with the provisions of this section.

1507.17.1 Material standards. ~~Photovoltaic modules~~ BIPV/shingles shall be listed and labeled in accordance with UL 1703.

1507.17.2 Attachment. ~~Photovoltaic modules~~ BIPV/shingles shall be attached in accordance with the manufacturer's installation instructions.

1507.17.3 Wind resistance. ~~Photovoltaic modules~~ BIPV/shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161. ~~Photovoltaic modules~~ BIPV/ shingles shall comply with the classification requirements of Table 1507.2.7.1(2) for the appropriate maximum nominal design wind speed. ~~Photovoltaic modules~~ BIPV/ shingle packaging shall bear a label to indicate compliance with the procedures in ASTM D 3161 and the required classification from Table 1507.2.7.1(2).

Revise as follows:

~~PHOTOVOLTAIC MODULES~~ BIPV/SHINGLES. A *roof covering* composed of ~~flat-plate~~ photovoltaic modules fabricated ~~in sheets that resemble three-tab composite~~ into shingles.

BUILDING INTEGRATED PHOTOVOLTAIC (BIPV) PRODUCT. A building product that incorporate photovoltaic modules, which covert solar radiation into electricity, and functions as a component of the building envelope.

PHOTOVOLTAIC PANEL (PV PANEL) SYSTEM. A system that combines discrete photovoltaic panels with photovoltaic modules, which covert solar radiation into electricity, with rack support systems that are mounted on a building or installed on a building site.

Reason: This code change proposal harmonizes the IBC definition for BIPV shingles with that contained in the recently approved ICC ES AC 365 (ACCEPTANCE CRITERIA FOR BUILDING-INTEGRATED PHOTOVOLTAIC (BIPV) ROOF COVERING SYSTEMS). Accordingly, Sections 1505.8 and 1507.17 are revised editorially to reflect the new definition.

Cost Impact: This proposal will not increase the cost of construction.

Staff note: The terminology proposed "photovoltaic panel (PV panel) system is currently not used in the IBC.

S46-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-PHOTOVOLTAIC MODULES SHINGLES-S-ROSS.doc

S48–12
1507.18 (NEW), 1507.18.1 (NEW), 1507.18.2 (NEW), 1507.18.3 (NEW)

Proponent: Bob Eugene, Underwriters Laboratories (robert.eugene@ul.com)

Add new text as follows:

1507.18 Polymer composite shingles. The installation of polymer composite shingles shall comply with the provisions of Sections 1507.18.1 through 1507.18.3.

1507.18.1 Material standards. Polymer composite shingles shall be listed and labeled in accordance with ASTM E 108 or UL 790.

1507.18.2 Attachment. Polymer composite shingles shall be attached as required by the manufacturer.

1507.18.3 Wind resistance. Polymer composite shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161. Polymer composite shingles shall comply with the classification requirements of Table 1507.2.7.1(2) for the appropriate maximum nominal design wind speed. Formed polymer composite shingle packaging shall bear a label to indicate compliance with the procedures in ASTM D 3161 and the required classification from Table 1507.2.7.1(2)

Reason: The proposal provides guidance for installers and code officials regarding the installation of polymer composite shingles. The appropriate design slope and fastening of the shingles are different for each manufacturer's product. For wind resistance, the procedures used in ASTM D 3161 for asphalt shingles are appropriate to use, when adapted for these types of shingles.

Cost Impact: The code change proposal will not increase the cost of construction.

S48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1507.18 (NEW)-S-EUGENE

S49–12
1508.1

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE

Revise as follows:

1508.1 General. The use of above-deck thermal insulation shall be permitted provided such insulation is covered with an *approved* roof covering and passes the tests of FM 4450 or UL 1256 when tested as an assembly.

Exceptions:

1. Foam plastic roof insulation shall conform to the material and installation requirements of Chapter 26.
2. Where a concrete roof deck is used and the above deck thermal insulation is covered with an *approved* roof covering.
3. <u>Where a thermal barrier meeting the requirements of Section 2603.4 is used to separate the foam plastic insulation from the interior of the building and the above deck thermal insulation is covered with an *approved* roof covering.</u>

Reason: The proposed wording clarifies requirements for the use of above deck insulation by providing an exception to the test requirements when a thermal barrier is used. Chapter 26 of the IBC currently recognizes that thermal barriers provide adequate protection for the use of foam plastic insulation (Section 2603.4). Thermal barriers will also provide adequate protection for other insulation types used in this application. Other commonly used types of insulation for this application are fiberglass, cellular fiber, mineral fiber, perlite and wood fiberboard. By making this change options for including above deck insulation are clearly spelled out.

Cost Impact: The code change proposal will not increase the cost of construction.

S49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1508.1-S-ENNIS

S50–12
Table 1508.2

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Revise as follows:

TABLE 1508.2
MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
<u>Fiber-reinforced gypsum board</u>	<u>ASTM C 1278</u>
<u>Glass-faced gypsum board</u>	<u>ASTM C 1177</u>
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C1289, Type I or Type II
Wood fiberboard	ASTM C 208

Reason: This code change proposal is intended to add recognized product standards to Table 1508.2-Material Standards for Roof Insulation for fiber-reinforced gypsum board and glass-faced gypsum board commonly used in roof assemblies.

ASTM C1278, "Standard Specification for Fiber-Reinforced Gypsum Panel," is the U.S. product standard applicable to fiber-reinforced gypsum board used in roof assemblies.

ASTM C1177, "Standard Specification for Glass Matt Substrate Used as Sheathing," is the U.S. product standard applicable to glass-faced gypsum board used in roof assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

S50-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1508.2-S-GRAHAM.doc

S51–12
202 (NEW), 1509 (NEW), 1509.1 (NEW), 1509.2 (NEW), 1509.3 (NEW), Chapter 35 (NEW)

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Mfg. Assoc. International (ken@nrgcodeadvocates.com)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOMPENT COMMITTEE.

Add new text as follows:

SECTION 202
DEFINITIONS

RADIANT BARRIER. A material having a low emittance surface (0.1 or less) and where installed in building assemblies, the low emittance surface shall face a ventilated or unventilated air space.

Add new text as follows:

SECTION 1509
RADIANT BARRIER-ABOVE DECK

1509.1 General. The use of above-deck radiant barriers shall be permitted provided that the radiant barrier is covered with an *approved* roof covering and passes the tests of FM 4450 or UL 1256 when tested as an assembly.

1509.2 Radiant barrier. Installed above-deck shall have a continuous 0.5 inch (minimum) air space on the low emittance side of the product.

1509.3 Material standards, Above-deck radiant barrier shall comply with ASTM C1313/1313M

Add new standard to Chapter 35 as follows:

ASTM

C1313/C1313M-10 Standard Specification for Sheet Radiant Barriers for Building Construction Applications

Reason: There is a common misunderstanding in the market that some radiant barrier products installed above-deck, typically between the deck and the felt, provide some level of thermal benefit. This is not the case and this proposal intends to clarify the air gap requirements for above-deck radiant barriers.

References:
ASTM C1313/C1313M-10 Standard Specification for Sheet Radiant Barriers for Building Construction Applications

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S51-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509-S-SAGAN

S52–12
1509.2.5

Proponent: Marshall Klein, Marshall A. Klein & Associates, Inc.

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC GENERAL CODE DEVELOMPENT COMMITTEE.

Revise as follows:

1509.2.5 Type of construction. Penthouses shall be constructed with walls, floors and roofs as required for the type of construction of the building on which such penthouses are built.

Exceptions:

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall not be required to have a fire-resistance rating.
2. On buildings of Type I construction two stories or less in height above grade plane or of Type II construction, the exterior walls and roofs of penthouses with a fire separation distance greater
   than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602 and be constructed of fire-retardant-treated wood. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be constructed of fire-retardant-treated wood and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of fire-retardant-treated wood.
3. On buildings of Type III, IV or V construction, the exterior walls of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602. On buildings of Type III, IV or VA construction, the exterior walls of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be of Type IV or noncombustible construction or fire-retardant-treated wood and shall not be required to have a fire-resistance rating.
4. <u>Where the penthouse is constructed in accordance with Section 1509.2 and is considered as a portion of the story directly below the roof deck, the floor of the penthouse is permitted to be constructed as required by Table 601 for the roof of the building on which such penthouse is built.</u>

Reason: Based on the intent of Section 1509.2, the "floor" of the penthouse should be considered for its fire resistance rating requirement under Table 601 as the "roof" of the building on which it is built.

If the provisions of the base paragraph of Section 1509.2.5 are followed as the code currently states, then the penthouse floor is required to be constructed "as required for the type of construction of the building on which such penthouses are built." This would imply that the floor of the penthouse must be built to the higher floor construction requirements of Table 601 instead of the more relaxed roof construction requirements for Construction Type I under Table 601 (i.e. Type IA from 2 hours to 1½ hours and Type IB from 2 hours to 1 hour).

The language of this new exception will clarify that the floor of penthouses that comply with the height, area, and use limitations mentioned in 1509.2 shall be built to the building's roof construction fire resistance rating of Table 601. In addition, penthouses' floors that comply with Section 1509 are intended to permit the use of the shaft requirement under Section 713.12 that relate to terminating the shaft at the roof not the floor. Conversely, if the penthouse does not meet the limitations that Section 1509.2 mentions (which would be compliance with Sections 1509.2.1 through 1509.2.5), then as the last sentence of that section states, the penthouse "shall be considered as an additional story", and the floor of the penthouse would need to meet the fire resistance floor requirements of Table 601 for the building's type of construction.

Cost Impact: The code change proposal will not increase the cost of construction.

S52-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.2.5-S-KLEIN

S53–12
1509.7.1

Proponent: Christine Covington, Solar Energy Industries Association

Revise as follows:

1509.7.1 ~~Wind resistance~~ Structural loads. Rooftop mounted photovoltaic systems shall be ~~designed for wind loads for component and cladding~~ capable of resisting applicable structural loads in accordance with Chapter 16 ~~using an effective wind area based on the dimensions of a single unit frame~~.

Reason: Rooftop PV systems may be subjected to structural loads other than wind. Seismic and snow loads may also be applicable and should be evaluated as part of the design.

IBC Chapter 16 addresses design loads with reference to ASCE 7. Chapter 16 and ASCE 7 include requirements for combinations of loads. Wind requirements are the subject of Chapters 26-31 of ASCE 7-10, which include multiple methods of determining wind loads. Components and cladding methods are appropriate for some rooftop PV systems, but not all. For example, some tall rooftop systems experience wind behavior appropriate to the Main Wind Force Resisting System, and some systems held close to the roof surface have been studied using Wind Tunnel testing. These approved wind load evaluation methods appear to be prohibited by the current language without justification.

Cost Impact: The code change proposal will increase the cost of construction.

S53-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.7.1-S-COVINGTON

S54–12
1509.7.2

Proponent: Joseph H. Cain, P.E., SolarCity Corporation, representing self

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE

Revise as follows:

1509.7.2 Fire classification. Rooftop mounted photovoltaic ~~systems~~ panels and modules shall have ~~the same~~ a fire classification as ~~the roof assembly~~ required for the roof assembly by Section 1505.

Reason: The testing method currently under development by the UL 1703 Standards Technical Committee is overly restrictive. The proposed code change will restore a photovoltaic (PV) panel/module fire classification without disproportionate economic burden to one industry.

Revisions to UL 1703 to include a PV system test are not yet ready for 2012 IBC implementation. Preliminary study of PV system fire classification has been conducted by Solar America Board for Codes and Standards in conjunction with Underwriter's Laboratories. For further information on Solar ABC's on-going fire testing, visit http://www.solarabcs.org/current-issues/fire_class_rating.html

Preliminary results indicate the test procedures being developed under proposed revisions to UL 1703 are overly restrictive, as the tests show nearly all common existing configurations of PV systems as "non-compliant." Using the existing language in 2012 IBC Section 1509.7.2, the UL 1703 Standards Technical Panel is developing language that would effectively trigger a fundamental re-start of the solar industry. The preliminary results indicate a testing standard with possible mitigation measures disproportionate in cost to the risks associated with rooftop installation of solar energy systems.

Preliminary tests by Underwriter's Laboratories have identified only three possible mitigation measures to date for rack-mounted PV systems. While further study is in order, the mitigation measures studied to date do not appear to be practical or cost-effective. The first mitigation measure is to install panels/modules in direct contact with the roof surface. This mitigation will be difficult or impossible to achieve on varying profiles of roof covering materials or on many roof surfaces experiencing code-allowable deflection. The second mitigation measure is to provide a barrier to prevent fire from entering between the PV panel system and the roof covering. An enclosure around the perimeter of all arrays installed tight to the profile of the roof covering will adversely affect the cost-effectiveness of solar electric power as it will simultaneously increase the cost of installation and decrease the production of electricity owing to over-heating panels/modules. The third mitigation measure is to install PV systems high above the roof surface. This will simultaneously increase cost and reduce sales of PV systems, as building owners and architects/designers are concerned about aesthetics as well as system performance.

The rapid adoption of solar technologies is a matter of national importance.

Cost Impact: The code change proposal will not increase the cost of construction.

S54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.7.2 #1-S-CAIN

S55–12
1509.7.2

Proponent: Christine Covington, Solar Energy Industries Association

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOMPENT COMMITTEE.

Revise as follows:

1509.7.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section 1505.

> <u>**Exception:** Photovoltaic panels and modules having a minimum Class C fire classification are permitted where listed and labeled in accordance with UL 1703 and where installed in direct contact with the roof surface.</u>

Reason: Fire testing of photovoltaic panels/modules was conducted on various roof systems by Underwriter's Laboratories in conjunction with Solar America Board for Codes and Standards (Solar ABC's). This study was conducted to assess the influence of PV panels/modules on the performance of classified roofing systems. This testing found that PV panels/modules placed in contact with the roof deck eliminated channeling of fire that was observed in some of the fire testing for elevated rack mounted systems. Channeling has been shown to contribute to flame spread when conducting the "spread of flame" test component of the fire classification evaluation. When PV panels/modules are installed in contact with the roof, the fire classification of the underlying roof system was not diminished. Therefore, this exception meets the ICC membership's intent to ensure that the installation of PV panels/modules do not degrade the fire classification rating of underlying roof systems.
For further information on Solar ABC's on-going fire testing, visit http://www.solarabcs.org/current-issues/fire_class_rating.html

Cost Impact: The code change proposal will not increase the cost of construction.

S55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.7.2 #1-S-COVINGTON

S56–12
1509.7.2

Proponent: Joseph H. Cain, P.E., SolarCity Corporation, representing self

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOMPENT COMMITTEE.

Revise as follows:

1509.7.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section 1505.

> **Exception:** Photovoltaic panels and modules having a minimum Class C fire classification are permitted where listed and labeled in accordance with UL 1703 and where installed on unlimited area buildings, as established in Section 507.

Reason: The testing method currently under development by the UL 1703 Standards Technical Committee is overly restrictive. The proposed code change will provide an exception for buildings with less risk, such as sprinklered, single story box stores surrounded and adjoined by public ways or yards.

Revisions to UL 1703 to include a PV system test are not yet ready for 2012 IBC implementation. Preliminary study of PV system fire classification has been conducted by Solar America Board for Codes and Standards in conjunction with Underwriter's Laboratories. For further information on Solar ABC's on-going fire testing, visit http://www.solarabcs.org/current-issues/fire_class_rating.html

Preliminary results indicate the test procedures being developed under proposed revisions to UL 1703 are overly restrictive, as the tests show nearly all common existing configurations of PV systems as "non-compliant." Using the existing language in 2012 IBC Section 1509.7.2, the UL 1703 Standards Technical Panel is developing language that would effectively trigger a fundamental re-start of the solar industry. The preliminary results indicate a testing standard with possible mitigation measures disproportionate in cost to the risks associated with rooftop installation of solar energy systems.

Preliminary tests by Underwriter's Laboratories have identified only three possible mitigation measures to date for rack-mounted PV systems. While further study is in order, the mitigation measures studied to date do not appear to be practical or cost-effective. The first mitigation measure is to install panels/modules in direct contact with the roof surface. This mitigation will be difficult or impossible to achieve on varying profiles of roof covering materials or on many roof surfaces experiencing code-allowable deflection. The second mitigation measure is to provide a barrier to prevent fire from entering between the PV panel system and the roof covering. An enclosure around the perimeter of all arrays installed tight to the profile of the roof covering will adversely affect the cost-effectiveness of solar electric power as it will simultaneously increase the cost of installation and decrease the production of electricity owing to over-heating panels/modules. The third mitigation measure is to install PV systems high above the roof surface. This will simultaneously increase cost and reduce sales of PV systems, as building owners and architects/designers are concerned about aesthetics as well as system performance.

The rapid adoption of solar technologies is a matter of national importance.

Cost Impact: The code change proposal will not increase the cost of construction.

S56-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.7.2 #2-S-CAIN

S57–12
1509.7.2

Proponent: Christine Covington, Solar Energy Industries Association

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOMPENT COMMITTEE.

Revise as follows:

1509.7.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section 1505.

> **Exception:** Photovoltaic panels having a minimum Class C fire classification are permitted where listed and labeled in accordance with UL 1703 and where installed at least 12 inches (305mm) above the roof surface.

Reason: Fire testing of photovoltaic panels/modules was conducted on various roof systems by Underwriter's Laboratories in conjunction with Solar America Board for Codes and Standards (Solar ABCs). This study was conducted to assess the influence of PV panels/modules on the performance of classified roofing systems. This testing found that PV panels/modules raised sufficiently above the roof deck reduced heat flux temperatures and mitigated any deleterious effects caused by channeling of fire underneath raised "rack mount" systems. Channeling has been shown to contribute to flame spread when conducting the "spread of flame" test component of the fire classification evaluation. When PV panels/modules are raised at least 12", the fire classification of the underlying roof system was not diminished. Therefore, this exception meets the ICC membership's intent to ensure that the installation of PV panels/modules do not degrade the fire classification rating of underlying roof systems.
For further information on Solar ABC's on-going fire testing, visit http://www.solarabcs.org/current-issues/fire_class_rating.html

Cost Impact: The code change proposal will not increase the cost of construction.

S57-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.7.2 #2-S-COVINGTON

S58–12
1509.7.2

Proponent: Christine Covington, Solar Energy Industries Association

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOMPENT COMMITTEE.

Revise as follows:

1509.7.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section 1505.

> **Exception:** Photovoltaic panels and modules arranged in arrays are permitted where the following conditions are met:
>
> 1.1. Photovoltaic panels and modules have a minimum Class C fire classification where listed and labeled in accordance with UL 1703;
> 1.2. The entire perimeter of the array is provided with a 0.0187-inch (0.4712 mm) (No. 26 gage) corrosion resistant steel or equivalent approved barrier extending from the array to the roof and;
> 1.3. Where any openings between the individual panels and modules on the upper face are provided with screens, flashing or otherwise protected to prevent entry of vegetative debris.

Reason: Fire testing of photovoltaic panels/modules was conducted on various roof systems by Underwriter's Laboratories in conjunction with Solar America Board for Codes and Standards (Solar ABCs). This study was conducted to assess the influence of PV panels/modules on the performance of classified roofing systems. This testing found that PV panels/modules provided with perimeter fire barrier flashing extending from the panel/module to the roof eliminated channeling of fire that was observed in some of the fire testing for elevated rack mounted systems. Channeling has been shown to contribute to flame spread when conducting the "spread of flame" test component of the fire classification evaluation. When PV panels/modules are installed with barrier flashing, the fire classification of the underlying roof system was not diminished. Therefore, this exception meets the ICC membership's intent to ensure that the installation of PV panels/modules do not degrade the fire classification rating of underlying roof systems. For further information on Solar ABC's on-going fire testing, visit http://www.solarabcs.org/current-issues/fire_class_rating.html

Cost Impact: The code change proposal will not increase the cost of construction.

S58-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1509.7.2 #3-S-COVINGTON

S59–12
1510.1

Proponent: Michael D. Fischer, Kellen Company, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Revise as follows:

1510.1 General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

> **Exception:** ~~Reroofing~~ Roof replacement or roof recover of existing low-slope roof coverings shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide positive roof drainage.

Reason: The current text is not clear that steep slope roof coverings are not included in the exception to the ¼ minimum slope requirement. This change is largely editorial since the roof covering approvals should govern.

Cost Impact: The code change proposal will not increase the cost of construction.

S59-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1510.1-S-FISCHER

S60–12
1510.1

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1510.1 General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

Exceptions:

1. Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide positive roof drainage.
2. Recovering or replacing an existing roof covering shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section 1503.4 for roofs that provide for positive roof drainage.

Reason: IBC 2006 and subsequent editions include a requirement in Section 1503.4-Roof Drainage that for roof drainage systems with roof drains or scuppers, secondary (emergency overflow) drains or scuppers also be provided in the event the primary roof drainage system becomes clogged.

Section 1510-Reroofing requires all materials and methods used in recovering or replacing an existing roof covering comply with the requirements of Chapter 15 (except the minimum roof slope requirement of ¼:12 can be waived for roofs that provide "…positive roof drainage."). This can be interpreted to require the secondary (emergency overflow) drains and scupper provision also apply in reroofing. Since many existing buildings were designed and constructed before the code included a secondary drainage requirement, the secondary drainage provision being applicable in reroofing and the need for adding secondary drains in exsiting buildings during reroofing can be a very costly and disruptive undertaking for owners and occupants.

This proposed code change adds an exception in Section 1510-Reroofing that waives the secondary drainage provision when reroofing existing buildings when the roof drains properly, that being hat provide for positive roof drainage. The term "positive roof drainage' is already defined in Section 202.

Cost Impact: The code change proposal will not increase the cost of construction.

S60-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1510.1-S-GRAHAM

S61 – 12
1510.2

Proponent: Michael D. Fischer, Kellen Company, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Revise as follows:

1510.2 Structural and construction loads. Structural roof components shall be capable of supporting the roof-covering system and the material and equipment loads that will be encountered during installation of the system. <u>Existing structural assemblies shall comply with the requirements of Section 3404.</u>

Reason: Chapter 34 provides good guidance to the designer regarding the types of conditions that should be evaluated during alterations. This proposal provides a necessary reference for the purposes of linking those requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

S61-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1510.2-S-FISCHER

S62–12
1510.3 (NEW), 1510.4

Proponent: Michael D. Fischer, Kellen Company, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Revise as follows:

1510.3 Roof replacement. Roof replacement shall include the removal of all existing layers of roof coverings down to the roof deck.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs where applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.
4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.
5. ~~Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.~~
6. ~~Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.~~
7. ~~Where the existing roof has two or more applications of any type of roof covering.~~

~~**1510.3**~~ **1510.4** ~~**Recovering versus replacement**~~ **Roof recovering.** ~~New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck~~ Roof recovering shall be prohibited where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.
4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

Reason: The current text is confusing and contains directions on what NOT to do regarding roof recovering. The proposal reorganizes the text without making any technical changes in order to add clarity to the code. The revisions provide clear distinction between roof replacement and roof recovering

Cost Impact: The code change proposal will not increase the cost of construction.

S62-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1510.3 (NEW)-S-FISCHER

S63–12
1510.3, 1510.4

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI) (m.ennis@mac.com)

Delete and substitute as follows:

~~**1510.3 Recovering versus replacement.** New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:~~

1. ~~Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.~~
2. ~~Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.~~
3. ~~Where the existing roof has two or more applications of any type of roof covering.~~

~~**Exceptions:**~~

1. ~~Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.~~
2. ~~Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.~~
3. ~~The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.~~
4. ~~Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional~~
~~layer of ice barrier membrane in accordance with Section 1507.~~

~~**1510.4 Roof recovering.** Where the application of a new roof covering over wood shingle or shake roofs creates a combustible concealed space, the entire existing surface shall be covered with gypsum board, mineral fiber, glass fiber or other *approved* materials securely fastened in place.~~

1510.3 Roof replacement. Roof replacement requires the removal of all existing roof coverings layers down to the roof deck before the new roof covering is installed. A roof replacement is required and roof recovering shall be prohibited where any of the following conditions exist:

1. Areas of the existing roof or roof covering that are water soaked or that have deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing unless those areas are removed and replaced prior to recover.
2. The existing roof covering is wood shake, slate, clay, cement, or asbestos-cement tile unless it is recovered in accordance with Section 1510.4.2.
3. The existing roof has two or more applications of any type of roof covering unless recovered in accordance with Section1510.4.5.

1510.4 Roof recovering. Roof recovering shall be permitted except where prohibited by section 1510.3.

1510.4.1 Existing complete and separate roofing systems. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.

1510.4.2 Existing wood shake roofs. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs where the entire surface is covered with gypsum board, mineral fiber, glass fiber, or other *approved* materials securely fastened in place.

1510.4.3 Existing spray polyurethane foam roofing systems. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

1510.4.4 Existing ice barrier membrane. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

1510.4.5 New single-ply membrane. The application of a new single-ply membrane directly over an existing low-slope (roof slope < 2:12) roofing system shall be permitted without tear-off of the existing roof coverings.

Reason: This code change proposal accomplishes several objectives:
1. Clarifies when a roof needs to be replaced and when is may be recovered.
2. Requires that existing water soaked or deteriorated sections of the roof be removed and replaced prior to recovering the roof. The current language would allow those areas to remain in place if any of the exceptions are used.
3. Adds an exception for the installation of a new single ply membrane because a layer of single-ply membrane is very lightweight, adding approximately 1/3 of a pound per square foot to the existing structure. In Climate Zones 1, 2 and 3, a single-ply membrane can be used as a reflective layer to reduce rooftop temperatures, thus providing a cooling benefit for the building, meeting the requirements of the International Energy Conservation Code and the heat island mitigation requirements of the International Green Construction Code. This exception will provide building owners with a cost effective option, with a variety of membrane colors and types, for installing a new waterproofing layer in all climate zones.

The new roof system will still need to meet the requirements of Chapter 15 as called out in Section 1510.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S63-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1510.3-S-ENNIS

S64–12
1510.7 (NEW)

Proponent: Al Godwin, CBO, CPM, representing Aon Fire Protection Engineering **(**al.godwin@aon.com)

Add new text as follows:

<u>**1510.7 Construction of sloped roof over flat roof.**</u> <u>Construction of a new roof over an existing roof, in a manner that creates an attic or concealed space shall require the removal of any existing roofing material composed of tar, asphalt or roof insulation not designed for interior use from the newly created interior space.</u>

Reason: It is not uncommon for building owners to convert a flat roof to a sloped roof. When doing so, the former roofing material should be removed from the newly created interior space.

Cost Impact: This code change proposal will increase the cost of construction.

S64-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1510.7 (NEW)-S-GODWIN

S65–12
1511.1.1

Proponent: Maureen Traxler, City of Seattle Department of Planning & Development (Maureen.traxler@seattle.gov); Thomas Meyers, City of Central, CO, representing self

Delete without substitution:

~~**1511.1.1 Structural fire resistance.** The structural frame and roof construction supporting the load imposed upon the roof by the photovoltaic panels/modules shall comply with the requirements of Table 601~~.

Reason: (Traxler) This section is not needed because Table 601 will apply regardless of this section. In addition, the terminology used is not consistent with the terms used in Table 601, creating confusion about whether the “structural frame…supporting the load imposed upon the roof” is different than the primary structural frame and secondary members referenced in Table 601. If they are different, then Table 601 doesn’t have any applicable requirements. If they are the same, the section isn’t necessary because compliance with Table 601 is already required by Chapter 6.
(Meyers) This new section was added as part of a comprehensive code change submitted to the IFC and ultimately approved as modified by public comment at the Dallas Final Action Hearings. The new subsection 1511.1.1 has generated considerable confusion. It has been interpreted to require any of the stand-off rack frame used to mount solar panels to the roof to be fire resistance rated consistent with the Type of Construction used by the building. In the case of I-A construction, this interpretation would require the typical aluminum square tube “column” supports to exhibit 3 hour fire endurance. This is extremely excessive and very difficult to achieve in an exposed, exterior application.

It appears that the intent may have been to ensure that the underlying supporting roof structure be provided with the fire performance prescribed by Chapter 6 when supporting any loads imposed by the solar panel array system that includes the racking system. The code already ensures that in Chapter 6. Therefore, this section is completely redundant. As such, it should be eliminated to avoid confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

S65-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1511.1.1-S-TRAXLER.doc

S66–12
202

Proponent: Phillip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Delete without substitution:

~~**ARCHITECTURAL TERRA COTTA.** Plain or ornamental hard-burned modified clay units, larger in size than *brick*, with glazed or unglazed ceramic finish.~~

~~**BOND BEAM.** A horizontal grouted element within *masonry* in which reinforcement is embedded.~~

~~**DURATION OF LOAD.** The period of continuous application of a given *load*, or the aggregate of periods of intermittent applications of the same *load*.~~

~~**GLUED BUILT-UP MEMBER.** A structural element, the section of which is composed of built-up lumber, wood structural panels or wood structural panels in combination with lumber, all parts bonded together with structural adhesives.~~

~~**INSPECTION CERTIFICATE.** An identification applied on a product by an *approved agency* containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an *approved agency* that indicates that the product or material has been inspected and evaluated by an *approved agency* (see Section 1703.5 and "*Label*," "Manufacturer's designation" and "*Mark*").~~

~~**RUBBLE MASONRY.** *Masonry* composed of roughly shaped stones.~~
~~**Coursed rubble.** Masonry composed of roughly shaped stones fitting approximately on level beds and well bonded.~~
~~**Random rubble.** Masonry composed of roughly shaped stones laid without regularity of coursing but well bonded and fitted together to form well-divided *joints.*~~
~~**Rough or ordinary rubble.** Masonry composed of unsquared field stones laid without regularity of coursing but well bonded.~~

~~**STACK BOND.** The placement of *masonry units* in a bond pattern is such that head *joints* in successive courses are vertically aligned. For the purpose of this code, requirements for stack bond shall apply to *masonry* laid in other than *running bond*.~~

~~**SUBDIAPHRAGM.** A portion of a larger wood *diaphragm* designed to anchor and transfer local forces to primary *diaphragm* struts and the main *diaphragm*.~~

Revise as follows:

[A] LABEL. An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an *approved agency* and that indicates that the representative sample of the product or material has been tested and evaluated by an *approved agency* (see Section 1703.5 and "~~Inspection certificate~~," "Manufacturer's designation" and "*Mark*").

[A] MANUFACTURER'S DESIGNATION. An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "~~Inspection certificate~~," "*Label*" and "*Mark*").

[A] MARK. An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "~~Inspection certificate~~," "*Label*" and "Manufacturer's designation").

Reason: The definitions are being deleted because they serve no purpose in the building code. There are no instances of any of the defined terms in the 2012 IBC other than as shown in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

S66-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1602.1-S-BRAZIL.doc

S67–12
1602

Proponent: Charles S. Bajnai, Chesterfield County, VA, representing ICC Building Code Action Committee (bajnaic@chesterfield.gov)

Revise as follows:

DIAPHRAGM. A horizontal or sloped system acting to transmit lateral forces to ~~the vertical-resisting elements~~ vertical elements of the lateral-force-resisting-system. When the term "diaphragm" is used, it shall include horizontal bracing systems.

Reason: This proposal cleans up a grammatical error with the current language. The current definition reads, "…transmit lateral forces to the **vertical-resisting** elements."

As written with the hyphenated term **"vertical-resisting"**, it means that the "elements" resist "vertical" which doesn't make sense. The definition should convey that the vertical elements of the system resist the lateral forces transmitted from the diaphragm(s). The current definition is the same as the definition in American Forest & Paper Associations' *Special Design Provisions for Wind and Seismic* (SDPWS) with the exception of the hyphen between "vertical" and "resisting" that does not occur in SDPWS. Better language is provided in American Society of Civil Engineers', *ASCE 7* where it states, for "Diaphragm Flexibility" in Section 12.3.1, ***"The structural analysis shall consider the relative stiffnesses of diaphragms and the vertical elements of the lateral-force-resisting systems."*** The ASCE 7 language is the best definition of the three and this proposal corrects the error in the current language and aligns it with ASCE 7.

IBC section 1604.4 reads correctly and states,

The total lateral force shall be distributed to the various ***vertical elements of the lateral force-resisting system*** *in proportion to their rigidities, considering the rigidity of the horizontal bracing system or diaphragm.*

This proposal does not change any technical requirements of the code. It merely addresses a grammar error and promotes consistency with ASCE 7 standard.

Cost Impact: The code change proposal will not increase the cost of construction.

S67-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1602-S-BAJNAI-BCAC.doc

S68–12
202 (NEW), 1607.12.3.1

Proponent: Sarah A. Rice, C.B.O., The Preview Group (srice@preview-group.com)

Revise as follows:

1607.12.3.1 Landscaped and vegetative roofs. The uniform design live load in unoccupied landscaped areas on roofs and vegetative roofs shall be 20 psf (0.958 kN/m^2). The weight of all landscaping and vegetative roof materials shall be considered as dead load and shall be computed on the basis of saturation of the soil.

Add new text as follows:

SECTION 202
DEFINITIONS

VEGETATIVE ROOF. An assembly of interacting components designed to waterproof and normally insulate a building's top surface that includes, by design, vegetation and related landscaping elements.

Reason: The IgCC includes an option for addressing the heat island impact of roofs with the installation of a vegetative roof on all or portions of the roof. The IBC addresses landscaped roofs and roof gardens. The vegetative roof is more akin to the landscaped roof in that it is not intended to be an area regularly occupied by building occupants, but is a feature similar to other roof coverings. This change places the loading concerns for vegetative roofs in the same section of Chapter 16 that regulates landscaped roofs. The proposed definition is a direct copy for the 2012 IgCC. It should be scoped for long term maintenance to the Code Development committees for the IgCC.

Cost Impact: The code change proposal will not increase the cost of construction.

S68-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.12.3.1-S-RICE.doc

S69–12
1603.1.3

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithustoninc.com)

Revise as follows:

1603.1.3 Roof snow load data. The ground snow load, P_g, shall be indicated. In areas where the ground snow load, P_g, exceeds 10 pounds per square foot (psf) (0.479 kN/m2), the following additional information shall also be provided, regardless of whether snow loads govern the design of the roof:

1. Flat-roof snow load, P_f.
2. Snow exposure factor, C_e.
3. Snow load importance factor, *I*.
4. Thermal factor, C_t.
5. <u>Drift surcharge load, p_d, where the sum of p_d and P_f exceeds 20 pounds per square foot (psf).</u>
6. <u>Width of snow drift, *w.*</u>

Reason: The addition of loading information and design assumptions to drawings has been valuable to owners and the engineers who are tasked with re-evaluating existing structures. This additional requirement of snow drift design information supplements the information already required and indicates how the registered design professional interpreted the design codes relative to snow drift intensity and width.

Cost Impact: The code change proposal will not increase the cost of construction.

S69-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1603.1.3-S-HUSTON

S70–12

703.2.3, [F]909.9, 1603.1.4, 1607.10.1.2, 1607.10.2, 1704.3.1, 1704.5 (NEW), 1704.5.1, 1704.5.2, Table 1705.3, Table 1705.7, 1705.9, 1705.12.3, 1803.4, 1910.9.3, 2207.2, 2207.3, 2303.4.1.4.1

THIS IS A 3 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE FIRESAFETY COMMITTEE AND PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE, AS THREE SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Phillip Brazil, P.E., S.E., Reid Middleton, representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

PART I – IBC STRUCTURAL

Revise as follows:

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral force resisting system of the structure:

1. Ultimate design wind speed, V_{ult}, (3-second gust), miles per hour (km/hr) and nominal design wind speed, V_{asd}, as determined in accordance with Section 1609.3.1.
2. *Risk category*.
3. Wind exposure. Where more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
4. The applicable internal pressure coefficient.
5. Components and cladding. The design wind pressures in terms of psf (kN/m^2) to be used for the design of exterior component and cladding materials not specifically designed by the <u>responsible</u> *registered design professional*.

1607.10.1.2 Heavy live loads. Live loads that exceed 100 psf (4.79 kN/m^2) shall not be reduced.

Exceptions:

1. The live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than *L* as calculated in Section 1607.10.1.
2. For uses other than storage, where *approved*, additional live load reductions shall be permitted where shown by the <u>responsible</u> *registered design professional* that a rational approach has been used and that such reductions are warranted.

1607.10.2 Alternative uniform live load reduction. As an alternative to Section 1607.10.1 and subject to the limitations of Table 1607.1, uniformly distributed live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m^2) except that the design live load for members supporting two or more floors is permitted to be reduced by a maximum of 20 percent.

   Exception: For uses other than storage, where *approved*, additional live load reductions shall be permitted where shown by the <u>responsible</u> *registered design professional* that a rational approach has been used and that such reductions are warranted.

2. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.

(Portions of section not shown remains unchanged)

Revise as follows:

1704.3.1 Content of statement of special inspections. The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have *special inspection* or testing by the *building official* or by the responsible *registered design professional* ~~responsible for each portion of the work~~.
2. The type and extent of each *special inspection*.
3. The type and extent of each test.
4. Additional requirements for *special inspection* or testing for seismic or wind resistance as specified in Sections 1705.10, 1705.11 and 1705.12.
5. For each type of *special inspection*, identification as to whether it will be continuous *special inspection* or periodic *special inspection*.

1704.5 Submittals to the building official. In addition to the submittal of reports of *special inspections* and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the *building official* after review and acceptance by the responsible *registered design professional* and prior to the construction or work being performed for each of the following:

(Renumber remaining sections)

1704.5.1 Structural observations for seismic resistance. Structural observations shall be provided for those structures assigned to *Seismic Design Category* D, E or F where one or more of the following conditions exist:

1. The structure is classified as *Risk Category* III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to *Seismic Design Category* E, is classified as *Risk Category* I or II in accordance with Table 1604.5, and is greater than two *stories above grade plane*.
4. When so designated by the responsible *registered design professional* ~~responsible for the structural design~~.
5. When such observation is specifically required by the *building official*.

1704.5.2 Structural observations for wind requirements. Structural observations shall be provided for those structures sited where *Vasd* as determined in accordance with Section 1609.3.1 exceeds 110 mph (49 m/sec), where one or more of the following conditions exist:

1. The structure is classified as *Risk Category* III or IV in accordance with Table 1604.5.
2. The *building height* of the structure is greater than 75 feet (22 860 mm).
3. When so designated by the responsible *registered design professional* ~~responsible for the structural design~~.
4. When such observation is specifically required by the *building official*.

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.
b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with ACI 355.2 or other qualification procedures. Where specific requirements are not provided, special inspection

requirements shall be specified by the responsible registered design professional and shall be approved by the building official prior to the commencement of the work.

(Portions of table not shown remains unchanged)

TABLE 1705.7
REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
7. For specialty elements, perform additional inspections as determined by the responsible registered design professional ~~in responsible charge~~.	—	—

(Portions of table not shown remains unchanged)

1705.9 Helical pile foundations. *Special inspections* shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the responsible *registered design professional* ~~*in responsible charge*~~. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance.

1705.12.3 Seismic certification of nonstructural components. The responsible *registered design professional* shall specify on the construction documents the requirements for certification by analysis, testing or experience data for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1705.12.

Revise as follows:

1803.4 Qualified representative. The investigation procedure and apparatus shall be in accordance with generally accepted engineering practice. The responsible *registered design professional* shall have a fully qualified representative on site during all boring or sampling operations.

Revise as follows:

1910.9.3 Natural curing. Natural curing shall not be used in lieu of that specified in this section unless the relative humidity remains at or above 85 percent, and is authorized by the responsible *registered design professional* and *approved* by the *building official*.

Revise as follows:

2207.2 Design. The responsible *registered design professional* shall indicate on the *construction documents* the steel joist and/or steel joist girder designations from the specifications listed in Section 2207.1 and shall indicate the requirements for joist and joist girder design, layout, end supports, anchorage, non-SJI standard bridging, bridging termination connections and bearing connection design to resist uplift and lateral loads. These documents shall indicate special requirements as follows:

1. Special loads including:
   1.1. Concentrated loads;
   1.2. Non-uniform loads;
   1.3. Net uplift loads;
   1.4. Axial loads;
   1.5. End moments; and
   1.6. Connection forces.
2. Special considerations including:
   2.1. Profiles for nonstandard joist and joist girder configurations (standard joist and joist girder configurations are as indicated in the SJI catalog);

2.2. Oversized or other nonstandard web openings; and
2.3. Extended ends.
3. Deflection criteria for live and total loads for non-SJI standard joists.

2207.3 Calculations. The steel joist and joist girder manufacturer shall design the steel joists and/or steel joist girders in accordance with the current SJI specifications and load tables to support the load requirements of Section 2207.2. The responsible *registered design professional* may require submission of the steel joist and joist girder calculations as prepared by a *registered design professional* responsible for the product design. If requested by the responsible *registered design professional*, the steel joist manufacturer shall submit design calculations with a cover letter bearing the seal and signature of the joist manufacturer's *registered design professional*. In addition to standard calculations under this seal and signature, submittal of the following shall be included:

1. Non-SJI standard bridging details (e.g.for cantilevered conditions, net uplift, etc.).
2. Connection details for:
   2.1. Non-SJI standard connections (e.g.flushframed or framed connections);
   2.2. Field splices; and
   2.3. Joist headers.

2303.4.1.4.1 Truss design drawings. Where required by the responsible *registered design professional*, the *building official* or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer.

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings, the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

PART II – IBC FIRE SAFETY

Revise as follows:

703.2.3 Restrained classification. Fire-resistance-rated assemblies tested under ASTM E 119 or UL 263 shall not be considered to be restrained unless evidence satisfactory to the *building official* is furnished by the responsible *registered design professional* showing that the construction qualifies for a restrained classification in accordance with ASTM E 119 or UL 263. Restrained construction shall be identified on the plans.

PART III - IFC

[F] 909.9 Design fire. The design fire shall be based on a rational analysis performed by the *registered design professional* and *approved* by the fire code official. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

Reason: The building code frequently refers to registered design professionals by specifying requirements for "the registered design professional" to perform. The design of a building or structure, however, is not accomplished by a single ("the") registered design professional but by a design team consisting of several registered design professionals, including an architect, structural engineer, geotechnical engineer, mechanical engineer, electrical engineer, plumbing engineer, fire protection engineer, civil engineer and others. In these cases, requiring "the registered design professional" to perform certain tasks is ineffective in that the particular registered design professional expected to perform the task is not identified. The proposal resolves this by revising the code to specify that the "responsible" registered design professional" shall perform the tasks.

The building code also frequently refers to "a registered design professional" to perform certain tasks. In these cases, the required tasks are typically not associated with the actions of a design team for a building or structure but are for a single individual who is also a registered design professional. There are also instances where the language is more specific than "a registered design professional" but the result is the same. We have judged these to be sufficiently clear that changes to the building code consistent with the intent of the proposal are not warranted. The instances are located in Sections 107.1, 107.3.4, 202 ("structural observation"), 909.21.4.4, 1603.1.9, 1605.1.1, 1612.3.1(2), 1612.5, 1704.3-Exc., 1704.5, 1705.6, 1705.7, 1705.8, 1709.2, 1709.3, 1709.3.2, 1710.3, 1803.1, 1803.3.1, 1803.5.10, 1804.4(2), 1810.2.1, 1810.2.4, 1810.3.3.1.2, 1810.3.5.2.2-Exc., 1810.4.11, 2109.3.4.1, 2207.4, 2211.3.3, 2303.4.1.2(3), 2303.4.1.3, 2303.4.4, 2303.4.5, 2308.8.2.1, 2308.10.7, 2403.2, 2404.4, 3405.2.1, B101.2.2, G103.3(2), J103.2(7), K105.3, K105.4, K105.5 and K105.6.

All instances of "registered design professional" in the building code were considered and are either in the proposal or are listed in the paragraph immediately above.

Note that there are instances of the "responsible registered design professional" in the building code and they are located in Section 909.18.8.3. Also, the definition of "registered design professional in responsible charge" was added to the building code by ICC proposal G33-06/07 – AS, Phillip Brazil, Proponent.

This proposal is also a continuation of a separate proposal that adds a new Section 1704.5 specifying submittals to the building official (Sxx-12/13). The charging language in new Section 1704.5 is identical in both proposals except that this proposal adds "approved" before "construction documents."

Cost Impact: The code change proposal will not increase the cost of construction.

S73-12

PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE – FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – INTERNATIONAL FIRE CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1603.1.4 #2-S-BRAZIL.doc

S71–12
1603.1.7

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov) (gregory.p.wilson@dhs.gov), Rebecca C. Quinn, RCQuinn Consulting, Inc., representing Department of Homeland Security, Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

1603.1.7 Flood design data. For buildings located in whole or in part in *flood hazard areas* as established in Section 1612.3, the documentation pertaining to design, if required in Section 1612.5, shall be included and the following information, referenced to the datum on the community's Flood Insurance Rate Map (FIRM), shall be shown, regardless of whether flood loads govern the design of the building:

1. *Risk Category* assigned according to ASCE 24.
~~1.~~ 2. In *flood hazard areas* not subject to high-velocity wave action, the elevation of the proposed lowest floor, including the basement.
~~2.~~3. In *flood hazard areas* not subject to high-velocity wave action, the elevation to which any nonresidential building will be dry flood proofed.
~~3.~~ 4. In *flood hazard areas* subject to high-velocity wave action, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including the basement.

Reason: The current edition of ASCE 24 uses the assigned occupancy/structure category primarily to determine elevation of buildings above the design flood elevation, in keeping with the general approach that more important buildings be designed for less frequent environmental loads. The next edition of ASCE 24 will include the Risk Category table from ASCE 7-10. The ASCE committee recognized that ASCE 7-10 eliminated the lists of buildings for each category and determined it important to ensure that the assignment of risk category be guided by definitions that are specifically developed to ensure that buildings in flood hazard areas are appropriately protected. Therefore, the next edition of ASCE 24 requires the user to reevaluate and possibly reassign a risk category specifically for the purpose of flood loads and flood resistant construction requirements.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. The definitions of each risk category that will be in the revised ASCE 24 and used only for the purpose of assigning risk category for flood-resistant design essentially retain the descriptions from the 2012 IBC Table 1604.5 of which buildings fall into each of the risk categories.

Analysis: Will the proposal introduce a conflict with Section 1604.5?

S71-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1603.1.7-S-INGARGIOLA-WILSON-QUINN.doc

S72–12
1603.1.8.1 (NEW), 1607.12.5 (NEW), 1607.12.5.1 (NEW), 1607.12.5.2 (NEW), 1607.12.5.3 (NEW), 1607.12.5.4 (NEW)

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Add new text as follows:

1603.1.8.1 Solar Photovoltaic (PV) Panels/Modules. The Roof/PV live load used in the design of Solar PV Panels shall be indicated on the construction documents.

1607.12.5 Solar Photovoltaic (PV) panels/modules. Solar PV panels/modules shall be designed in accordance with Sections 1607.12.5.1 through 1607.12.5.4, as applicable.

1607.12.5.1 Roof/PV live load. The roof/PV live load is a 20 psf uniform load. Unless each Solar PV panel/module is clearly and permanently marked "Do not walk on this surface – not intended for maintenance access or pedestrian traffic", and appropriate maintenance access paths are provided a non-concurrent 300 pound concentrated load as set forth in Table 1607.1 shall also be applied. The individual Solar PV panels/modules shall be designed to withstand the Roof/PV live load, in combination with other applicable loads.

1607.12.5.2 PV panels/modules. Solar PV panels/modules designed to be installed over and supported by a roof, shall have the structural supports of the roof designed to accommodate the full dead load, including the Solar PV panels/modules dead load; the Roof/PV live load in the areas of the Solar PV panels/modules in combination with other applicable loads. The roof area underneath any Solar PV panels/modules shall also be designed for load combinations including roof live load, in combination with other applicable loads, without the Solar PV panels/modules.

1607.12.5.3 PV panels/modules installed as an independent structure. Solar PV panels/modules that are independent structures and do not have accessible /occupied space underneath are not required to accommodate a roof/PV live load, provided they are marked as required in Section 1607.12.5.1, and the area under the structure is restricted to keep the public away. All other loads and combinations per Section 1605 shall be accommodated.

Solar PV panels/modules that are designed to be the roof, and span to structural supports, and have accessible/occupied space underneath shall have the panels/modules and all supporting structure designed to support a Roof/PV live load, as defined in section 1607.12.5.1 in combination with other applicable loads. Solar PV panels/modules in this application are not permitted to be classified as "not accessible" per 1607.12.5.1.

1607.12.5.4 Ballasted systems. Solar PV panels/modules installed on a roof as a ballasted system need not be rigidly attached to the roof or supporting structure. Ballasted systems shall be designed and installed only on roofs with slopes of ½" per foot or less. The structural supports of the roof under a ballasted system shall be designed, or analyzed, per section 1604.4; checked in accordance with Section 1604.3.6 for deflections; and checked in accordance with Section 1611 for ponding. The ballasted system shall be designed to resist sliding and uplift resulting from lateral and vertical forces as required by Section 1605, using a coefficient of friction determined by acceptable engineering principles.

Reason: This new section is bringing in requirements for Solar PV panels that is currently absent in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

S72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1603.1.8.1 (NEW)-S-HUSTON

S73–12
1603.1.9

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Delete without substitution:

~~**1603.1.9 Systems and components requiring special inspections for seismic resistance.** **C***onstruction documents* or specifications shall be prepared for those systems and components requiring *special inspection* for seismic resistance as specified in Section 1705.11 by the *registered design professional* responsible for their design and shall be submitted for approval in accordance with Section 107.1. Reference to seismic standards in lieu of detailed drawings is acceptable.~~

Reason: Section 1603.1.9 is being deleted because it serves no purpose not already being served by Section 107.1, which requires construction documents that are submitted with each permit application to be prepared by a registered design professional but only where required by the statutes of the jurisdiction in which the construction or work is located. Section 1603.1.9, however, requires preparation of construction documents or specifications by the registered design professional responsible for the design of the system or component and references Section 107.1 for the submittal, but not the preparation, of the construction documents.

The deletion also eliminates a conflict with the charging language in Section 1603.1, which requires design loads and other information pertinent to the structural design to be specified on the construction documents. Section 1603.1.9, however, specifies no such design loads or other pertinent information.

Cost Impact: The code change proposal will not increase the cost of construction.

S73-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1603.1.9-S-BRAZIL.doc

S74–12

Table 1604.3

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS[a,b,c,h,i]

CONSTRUCTION	L	S or W[f]	D + L[d,g]
Roof Members:[e]			
Supporting plaster ceiling	l / 360	l / 360	l / 240
Supporting plaster ceiling	l / 240	l / 240	l / 180
Not supporting ceiling	l / 180	l / 180	l / 120
Floor Members	l / 360	-	l / 240
Exterior walls and interior partitions:			
With plaster or stucco finishes	-	l / 360	-
With other brittle finishes	-	l / 240	-
With flexible finishes	-	l / 120	-
Farm buildings	-	-	l / 180
Greenhouses	-	-	l / 120

b. ~~Interior partitions not exceeding 6ft in height and~~ Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in section 1607.14.

(Portions of Table not shown remain unchanged)

Reason: In footnote b the reference to interior partitions not exceeding 6ft in height is redundant and not needed. The second sentence of the footnote refers the user to Section 1607.14 (attached to the proposed change for reference) which already limits the live loading to partitions exceeding 6 feet.

Cost Impact: The code change proposal will not increase the cost of construction.

S74-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1604.3#1-S-HUSTON.doc

S75–12
Table 1604.3, 1607.14, 1607.14.1

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS[a, b, c, h, i]

CONSTRUCTION	L	S or W[f]	D + L[d,g]
Roof Members:[e]			
Supporting plaster ceiling	*l* / 360	*l* / 360	*l* / 240
Supporting plaster ceiling	*l* / 240	*l* / 240	*l* / 180
Not supporting ceiling	*l* / 180	*l* / 180	*l* / 120
Floor Members	*l* / 360	-	*l* / 240
Exterior walls ~~and interior partitions~~:			
With plaster or stucco finishes	-	*l* / 360	-
With other brittle finishes	-	*l* / 240	-
With flexible finishes	-	*l* / 120	-
Interior Partitions:[b]			
With plaster or stucco finishes	*l* / 360	-	-
With other brittle finishes	*l* / 240	-	-
With flexible finishes	*l* / 120	-	-
Farm buildings	-	-	*l*/180
Greenhouses	-	-	*l*/120

(Portions of Table not shown remain unchanged)

1607.14 Interior walls and partitions. Interior walls and partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength and stiffness to resist the loads to which they are subjected but not less than a horizontal load of 5 psf (0.240 kN/m2).

> **Exception:** Fabric partitions complying with Section 1607.14.1 shall not be required to resist the minimum horizontal load of 5 psf (0.24 kN/m2).

1607.14.1 Fabric partitions. Fabric partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength and stiffness to resist the following load conditions:

1. A horizontal distributed load of 5 psf (0.24 kN/m2) applied to the partition framing. The total area used to determine the distributed load shall be the area of the fabric face between the framing members to which the fabric is attached. The total distributed load shall be uniformly applied to such framing members in proportion to the length of each member.
2. A concentrated load of 40 pounds (0.176 kN) applied to an 8-inch diameter (203 mm) area [50.3 square inches (32 452 mm2)] of the fabric face at a height of 54 inches (1372 mm) above the floor.

Reason: Currently Table 1604.3 does not have deflection limits for Live Loads on Interior walls. The 5.0psf requirement in section 1607.14 is classified as a live load and would not require a deflection check. Under the legacy Uniform Building Code this load was treated as an "other load" and was required to meet the deflection limits similar to those in IBC Table 1604.3. To avoid confusion for walls, and to require deflection checks on interior walls, the proposed code change is necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

S75-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1604.3#2-S-HUSTON.doc

S76–12
Table 1604.3

Proponent: Brad Douglas, PE, American Wood Council (pcoats@awc.org)

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS[a, b, c, h, i]

(Portions of Table and footnotes not shown remain unchanged)

~~d For wood structural members having a moisture content of less than 16 percent at time of installation and used under dry conditions, the deflection resulting from *L* + 0.5*D* is permitted to be substituted for the deflection resulting from *L* + *D*.~~

d. The deflection limit for the *D+L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5D shall not be used in combination with NDS provisions for long-term loading.

Reason: Deflection limits for the load combination *D+L*, were taken from the UBC deflection limits. However, the intent of the UBC limits was not brought forward. The original intent of these provisions was to limit the total deflection based on the combination of live load deflection and the creep component of the dead load deflection. As a result, there have been several prior code cycle modifications to these provisions to re-instate the original intent, such as the addition of footnote "g" for steel structural members which effectively excludes steel from checking for the creep component of dead load deflection. As currently written and formatted, the *D+L* deflection provision can be misinterpreted to suggest that the total deflection due to dead load, *D*, including both the immediate and creep components of the dead load deflection, should be used with the deflection limit in this column. Additionally, use of 0.5*D* in footnote "d" is potentially non-conservative without clarification that the 0.5*D* load reduction approach is a numerically consistent alternative to the NDS provisions. Without this clarification, a potential misinterpretation is that the creep component of dead load deflection is to be calculated using NDS provisions and the reduced dead load (i.e. 0.5*D*). This change makes calculation of *D+L* deflection for comparison against the *D+L* deflection limit in Table 1604.3 consistent with the provisions in NDS 3.5.2 for long-term loading and consistent with the stated intent in the UBC and with similar provisions in ACI 318 as described in the ACI 318 Commentary. The applicable NDS provisions are shown below for reference.

NDS 3.5.2 Long-Term Loading:

3.5 Bending Members – Deflection

3.5.1 Deflection Calculations

If deflection is a factor in design, it shall be calculated by standard methods of engineering mechanics considering bending deflections and, when applicable, shear deflections. Consideration for shear deflection is required when the reference modulus of elasticity has not been adjusted to include the effects of shear deflection (see Appendix F).

3.5.2 Long-Term Loading

Where total deflection under long-term loading must be limited, increasing member size is one way to provide extra stiffness to allow for this time dependent deformation (see Appendix F). Total deflection, Δ_T, shall be calculated as follows:

$$\Delta_T = K_{cr}\,\Delta_{LT} + \Delta_{ST} \qquad (3.5\text{-}1)$$

where:

K_{cr} = time dependent deformation (creep) factor

= 1.5 for seasoned lumber, structural glued laminated timber, prefabricated wood I-joists, or structural composite lumber used in dry service conditions as defined in 4.1.4, 5.1.4, 7.1.4, and 8.1.4, respectively.

= 2.0 for structural glued laminated timber used in wet service conditions as defined in 5.1.4.

= 2.0 for wood structural panels used in dry service conditions as defined in 9.1.4.

= 2.0 for unseasoned lumber or for seasoned lumber used in wet service conditions as defined in 4.1.4.

Δ_{LT} = immediate deflection due to the long-term component of the design load, in.

Δ_{ST} = deflection due to the short-term or normal component of the design load, in.

Cost Impact: The code change proposal will not increase the cost of construction.

S76-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1604.3-S-DOUGLAS.doc

S77–12
Table 1604.3

Proponent: John Woestman, Kellen Company, representing Builders Masonry Veneer Manufacturers Association (MVMA) (jwoestman@kellencompany.com)

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS[a,b,c,h, i]

CONSTRUCTION	L	S OR W[f]	D + L[d, g]
Exterior walls and interior partitions:			
With plaster or stucco finishes	---	//360	---
With other brittle finishes[j]	---	//240	---
With flexible finishes	---	//120	---

[j] Includes adhered masonry veneer.

(Portions of Table not shown remain unchanged)

Reason: This code proposal should help with a consistent deflection limit applied to wall systems with adhered masonry veneer.
Adhered masonry veneer does not have the large, flat, monolithic surface of plaster or stucco finishes. As such, adhered masonry veneer can accommodate more deflection.

Cost Impact: The code change proposal will not increase the cost of construction.

S77-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1604.3-S-WOESTMAN.doc

S78–12

Table 1604.3

Proponent: Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee (tzaremba@ralaw.com)

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS[a, b, c, h, i]

CONSTRUCTION	*L*	*S* or *W*[f]	*D* + *L*[d, g]
Roof members:[e]			
Supporting plaster or stucco ceiling	*l*/360	*l*/360	*l*/240
Supporting nonplaster ceiling	*l*/240	*l*/240	*l*/180
Not supporting ceiling	*l*/180	*l*/180	*l*/120
Floor members	*l*/360	---	*l*/240
Exterior walls and interior partitions:			
With plaster or stucco finishes	---	*l*/360	---
With other brittle finishes	---	*l*/240	---
With flexible finishes	---	*l*/120	---
Farm buildings	---	---	*l*/180
Greenhouses	---	---	*l*/120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *l*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *l*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not exceed *l*/90. For roofs, this exception only applies when the metal sheets have no roof covering.
b. Interior partitions not exceeding 6 feet in height and flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.
c. See Section 2403 for glass supports.
d. For wood structural members having a moisture content of less than 16 percent at time of installation and used under dry conditions, the deflection resulting from *L* + 0.5*D* is permitted to be substituted for the deflection resulting from *L* + *D*.
e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to assure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.
f. W shall be taken as the nominal load for wind. The wind load is permitted to be taken as 0.42 times the "component and cladding" loads for the purpose of determining deflection limits ~~herein~~ for main windforce-resisting systems.
g. For steel structural members, the dead load shall be taken as zero.
h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers, not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *l*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *l*/175 for each glass lite or *l*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *l*/120.
i. For cantilever members, *l* shall be taken as twice the length of the cantilever.

Reason: Section 1605.2 of the IBC provides load combinations using strength or factored load design while 1605.3 provides load combinations using allowable stress design. For wind load determination, ASCE 7-10 is now based on strength design and ultimate wind speeds. Conversion to allowable working stress (nominal) loads is accomplished by multiplying the factored wind load by 0.6.

The original reduction of 0.7 in footnote (f) in earlier editions of the IBC was changed last cycle by multiplying 0.7 and 0.6 to get the 0.42 factor now shown in the current code. The added sentence to the beginning of the footnote is a clarification to use nominal loads for wind used in allowable stress design to determine deflection which corresponds to the use of the 0.42 reduction.

A second clarification is also added at the end of footnote (f) to properly restrict the use of the 0.42 reduction to deflection calculations of main structural members shown in the Table 1604.3 when using "component and cladding wind load and preventing users from inappropriately combining this reduction with component and cladding deflections described in footnotes (a), (c), and (h) of this table.

Cost Impact: The code change proposal will not increase the cost of construction.

S78-12

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1604.3-S-ZAREMBA.doc

S79–12
202, 1602.1, 1604.4, 1610.1 1613.5.6.1

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Delete without substitution:

SECTION 202
DEFINITIONS

DIAPHRAGM. A horizontal or sloped system acting to transmit lateral forces to the vertical-resisting elements. When the term “diaphragm” is used, it shall include horizontal bracing systems.

~~**Diaphragm flexible.** A diaphragm is flexible for the purpose of distribution of story shear and torsional moment where so indicated in Section 12.3.1 of ASCE 7.~~
~~**Diaphragm, rigid.** A diaphragm is rigid for the purpose of distribution of story shear and torsional moment when the lateral deformation of the diaphragm is less than or equal to two times the average story drift.~~

Revise as follows:

SECTION 1602
DEFINITIONS AND NOTATIONS

1602.1 Definitions. The following terms are defined in Chapter 2:

DIAPHRAGM.
Diaphragm, blocked.
Diaphragm boundary.
Diaphragm chord.
~~**Diaphragm flexible.**~~
~~**Diaphragm, rigid.**~~

(Portions of text not shown remains unchanged)

1604.4 Analysis. *Load effects* on structural members and their connections shall be determined by methods of structural analysis that take into account equilibrium, general stability, geometric compatibility and both short- and long-term material properties.

Members that tend to accumulate residual deformations under repeated service loads shall have included in their analysis the added eccentricities expected to occur during their service life.

Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a complete load path capable of transferring loads from their point of origin to the load-resisting elements.

The total lateral force shall be distributed to the various vertical elements of the lateral force-resisting system in proportion to their rigidities, considering the rigidity of the horizontal bracing system or diaphragm. Rigid elements assumed not to be a part of the lateral force-resisting system are permitted to be incorporated into buildings provided their effect on the action of the system is considered and provided for in the design~~. Except where diaphragms are flexible, or are permitted to be analyzed as flexible,~~ Provisions shall be made for the increased forces induced on resisting elements of the structural system resulting from torsion due to eccentricity between the center of application of the lateral forces and the center of rigidity of the lateral force-resisting system<u>, except where diaphragms are considered as flexible, permitted to be idealized as flexible or semi-rigid, in accordance with Section 12.3.1 of ASCE for seismic loads or Chapter 26 of ASCE 7 for wind loads</u>.

Every structure shall be designed to resist the overturning effects caused by the lateral forces specified in this chapter. See Section 1609 for wind loads, Section 1610 for lateral soil loads and Section 1613 for earthquake loads.

1610.1 General. Foundation walls and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless determined otherwise by a geotechnical investigation in accordance with Section 1803. Foundation walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and rotate at the top shall be permitted to be designed for active pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils at the site are expansive. Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections 1805.4.2 and 1805.4.3.

> **Exception:** Foundation walls extending not more than 8 feet (2438 mm) below grade and laterally supported at the top by ~~flexible~~ diaphragms considered as flexible, permitted to be idealized as flexible or semi-rigid, in accordance with Section 12.3.1 of ASCE for seismic loads or Chapter 26 of ASCE for wind loads shall be permitted to be designed for active pressure.

1613.3.5.1 Alternative seismic design category determination. Where S_1 is less than 0.75, the *seismic design category* is permitted to be determined from Table 1613.3.5(1) alone when all of the following apply:

1. In each of the two orthogonal directions, the approximate fundamental period of the structure, T_a, in each of the two orthogonal directions determined in accordance with Section 12.8.2.1 of ASCE 7, is less than 0.8 T_s determined in accordance with Section 11.4.5 of ASCE 7.
2. In each of the two orthogonal directions, the fundamental period of the structure used to calculate the story drift is less than T_s.
3. Equation 12.8-2 of ASCE 7 is used to determine the seismic response coefficient, C_s.
4. The diaphragms are rigid as defined in Section 12.3.1 of ASCE 7 or, for diaphragms that are considered flexible, permitted to be idealized as flexible or semi-rigid in accordance with Section 12.3.1 of ASCE 7, the distances between vertical elements of the seismic force-resisting system do not exceed 40 feet (12 192 mm).

Reason: The ICC Building Code Action Committee was asked to look at clearing up potential conflicts between the references to, and definitions of, flexible and rigid diaphragms in the IBC and ASCE-7-10. The BCAC did identify potential conflicts between the IBC's definition of a rigid diaphragm and the ASCE 7-10 criteria for classifying a diaphragm as rigid, semi-rigid or flexible. Also, it is considered inappropriate to include enforceable code requirements or references to standards as part of a definition. Thus, by this proposal, the BCAC proposes to remove the separate definitions for flexible and rigid diaphragms from the IBC and supply direct references in IBC Chapter 16 to the relevant requirements in the ASCE 7 seismic and wind chapters for when a diaphragm can be idealized as flexible or semi-rigid. This reference only occurs in the IBC in the sections noted in the code change proposal. In practical application, the code user will be turning to the requirements of ASCE-7 to categorize the diaphragm and perform the design. Therefore, there is no real need or advantage to provide the definitions in the IBC and this will prevent future maintenance of the terms and/or conflict between them.

For reference, ASCE 7-10 states,

12.3.1 Diaphragm Flexibility

The structural analysis shall consider the relative stiffnesses of diaphragms and the vertical elements of the seismic force-resisting system. Unless a diaphragm can be idealized as either flexible or rigid in accordance with Sections 12.3.1.1, 12.3.1.2, or 12.3.1.3, the structural analysis shall explicitly include consideration of the stiffness of the diaphragm (i.e., semirigid modeling assumption).

12.3.1.1 Flexible Diaphragm Condition

Diaphragms constructed of untopped steel decking or wood structural panels are permitted to be idealized as flexible if any of the following conditions exist:

a. In structures where the vertical elements are steel braced frames, steel and concrete composite braced frames or concrete, masonry, steel, or steel and concrete composite shear walls.
b. In one-and two-family dwellings.
c. In structures of light-frame construction where all of the following conditions are met:

1. Topping of concrete or similar materials is not placed over wood structural panel diaphragms except for nonstructural topping no greater than 1 ½" in (38mm) thick.
2. Each line of vertical elements of the seismic force-resisting system complies with the allowable story drift of Table 12.12-1

12.3.1.2 Rigid Diaphragm Condition
Diaphragms of concrete slabs or concrete filled metal deck with span-to-depth ratios of 3 or less in structures that have no horizontal irregularities are permitted to be idealized as rigid.
12.3.1.3 Calculated Flexible Diaphragm Condition
Diaphragms not satisfying the conditions of Sections 12.3.1.1 or 12.3.1.2 are permitted to be idealized as flexible where the computed maximum in-plane deflection of the diaphragm under lateral load is more than two times the average story drift of adjoining vertical elements of the seismic force-resisting system of the associated story under equivalent tributary lateral load as shown in Fig. 12.3-1. The loadings used for this calculation shall be those prescribed by Section 12.8.

Cost Impact: The code change proposal will not increase the cost of construction.

S79-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1604.4-S-BAJNAI-BCAC.doc

S80–12
202, 1604.4, 1810.3.1.4, 1810.3.1.5, 1908.2, Table 1908.2 and Table 1908.3

Proponent: Jerry R. Tepe, FAIA, JRT-AIA, representing American Institute of Architects (jrtaia@aol.com)

Revise as follows:

SECTION 202
DEFINITIONS

DANGEROUS. Any *building*, *structure* or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The *building* or *structure* has collapsed, has partially collapsed, has moved off its foundation or lacks the necessary support of the ground.
2. There exists a significant risk of collapse, detachment or dislodgment of any portion, member, appurtenance or ornamentation of the *building* or *structure* under ~~service~~ nominal loads.

Revise as follows:

1604.4 Analysis. *Load effects* on structural members and their connections shall be determined by methods of structural analysis that take into account equilibrium, general stability, geometric compatibility and both short- and long-term material properties.

Members that tend to accumulate residual deformations under repeated ~~service~~ nominal loads shall have included in their analysis the added eccentricities expected to occur during their service life.

Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a complete load path capable of transferring loads from their point of origin to the load-resisting elements.

The total lateral force shall be distributed to the various vertical elements of the lateral force-resisting system in proportion to their rigidities, considering the rigidity of the horizontal bracing system or diaphragm. Rigid elements assumed not to be a part of the lateral force-resisting system are permitted to be incorporated into buildings provided their effect on the action of the system is considered and provided for in the design. Except where diaphragms are flexible, or are permitted to be analyzed as flexible, provisions shall be made for the increased forces induced on resisting elements of the structural system resulting from torsion due to eccentricity between the center of application of the lateral forces and the center of rigidity of the lateral force-resisting system.

Every structure shall be designed to resist the overturning effects caused by the lateral forces specified in this chapter. See Section 1609 for wind loads, Section 1610 for lateral soil loads and Section 1613 for earthquake loads.

Revise as follows:

1810.3.1.4 Driven piles. Driven piles shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by handling, driving and ~~service~~ nominal loads.

1810.3.1.5 Helical piles. Helical piles shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by installation into the ground and ~~service~~ nominal loads.

Revise as follows:

1908.2 Allowable service load. The allowable ~~service~~ nominal load for headed anchors in shear or tension shall be as indicated in Table 1908.2. Where anchors are subject to combined shear and tension, the following relationship shall be satisfied:

$(P_s / P_t)5/3 + (V_s / V_t)^{5/3} \leq 1$ **(Equation 19-1)**

where:

P_s = Applied tension ~~service~~ nominal load, pounds (N).
P_t = Allowable tension ~~service~~ nominal load from Table 1908.2, pounds (N).
V_s = Applied shear ~~service~~ nominal load, pounds (N).
V_t = Allowable shear ~~service~~ nominal load from Table 1908.2, pounds (N).

TABLE 1908.2
ALLOWABLE ~~SERVICE~~ NOMINAL LOAD ON EMBEDDED BOLTS (pounds)
(Portions of table not shown remain unchanged)

1908.3 Required edge distance and spacing. The allowable ~~service~~ nominal loads in tension and shear specified in Table 1908.2 are for the edge distance and spacing specified. The edge distance and spacing are permitted to be reduced to 50 percent of the values specified with an equal reduction in allowable ~~service~~ nominal load. Where edge distance and spacing are reduced less than 50 percent, the allowable ~~service~~ nominal load shall be determined by linear interpolation.

Reason: “Nominal loads” is a defined term whereas “service loads” is not. Per IBC Interpretation 23-10 issued 12-08-2010, the terms are synonymous. (Note interpretation was from the 2009 edition) Dangerous is used in Chapter 34. The intent is to make this change wherever it occurs in the IBC. What is shown was derived from a word search of the PDF document.

IBC Interpretation 23-10
Q: Is the term "service loads" as used in the definition of DANGEROUS synonymous with the definition of NOMINAL LOADS as defined in Section 1602?
A**:** Yes. The intent is to address loads that a building is likely to experience and precludes consideration of a FACTORED LOAD which applies to limit state or strength design.

NOMINAL LOADS. The magnitudes of the *loads* specified in Chapter 16 (dead, live, soil, wind, snow, rain, *flood* and earthquake).
FACTORED LOAD**.** The product of a *nominal load* and a *load factor*.

Cost Impact: The code change proposal will not increase the cost of construction.

S80-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-DANGEROUS-G-TEPE

S81–12
1604.5.1

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

1604.5.1 Multiple occupancies. Where a building or structure is occupied by two or more occupancies not included in the same *risk category*, it shall be assigned the classification of the highest *risk category* corresponding to the various occupancies. Where buildings or structures have two or more portions that are structurally separated, each portion shall be separately classified. Where a separated portion of a building or structure provides required access to, required egress from or shares life safety components with another portion having a higher *risk category*, both portions shall be assigned to the higher *risk category*.

> <u>**Exception:** A single public assembly room with an occupant load of less than 500 shall be allowed in a *Risk Category II* building or structure and not be considered a multiple occupancy or a separate occupancy.</u>

Reason: The revision to 1604.5.1 will allow a single, modest meeting room or auditorium within an office building (a Risk Category II Building) without requiring the entire building to be designed as a Risk Category III.

Cost Impact: The code change proposal will not increase the cost of construction.

S81-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1604.5.1-S-HUSTON

S82–12
1604.5

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

1604.5 Risk category. Each building and structure shall be assigned a *risk category* in accordance with Table 1604.5. Where a referenced standard specifies an occupancy category, the *risk category* shall not be taken as lower than the occupancy category specified therein. <u>Where a referenced standard specifies that the assignment of a risk category be in accordance with ASCE 7, Table 1.5-1, Table 1604.5 shall be used in lieu of ASCE 7, Table 1.5-1.</u>

Reason: IBC Table 1604.5 has a concise and extensive list of various occupancies, whereas ASCE 7, Table 1.5-1 is limited and , being a standard, rather than a code, much more general. This can lead to confusion in the appropriate determination of a risk category, if one tries to comply with both.

As examples of when one can be referred to both tables, consider:

1. IBC Section 1609 Wind Loads requires wind loads to be determined in accordance with ASCE 7, chapters 26 thru 30. The confusion comes in when you are in those chapters of ASCE 7, risk categories per Table 1.5-1 are referenced (26.5.1; Table 27.5-1; Table 28.2-1; Table 29.1-1; Tables 30.4-1 thru 30.7-1).
2. AISC 360-10, Section N5.5b also references ASCE 7 Table 1.5-1 as follows:

5b. CJP Groove Weld NDT
For structures in Risk Category III or IV of Table 1.5-1, Risk Category of Buildings and Other Structures for Flood, Wind, Snow, Earthquake and Ice Loads, of ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, UT shall be performed by QA on all CJP groove welds subject to transversely applied tension loading in butt, T- and corner joints, in materials 5/16 in. (8 mm) thick or greater. For structures in Risk Category II, UT shall be performed by QA on 10% of CJP groove welds in butt, T- and corner joints subject to transversely applied tension loading, in materials 5/16 in. (8 mm) thick or greater.

This code change is intended to provide consistency by using only IBC Table 1604.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Does IBC Section 102.4.1 already provide sufficient clarification?

S82-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1604.5-S-HUSTON

S83–12
Table 1604.5

Proponent: William W. Stewart, FAIA, representing self (codedoc@sbcglobal.net)

Revise as follows:

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing ~~elementary school, secondary school or day care facilities~~ Group E occupancies with an occupant load greater than 250. • Buildings and other structures containing ~~adult education facilities, such as colleges and universities~~, educational occupancies for students above the 12th grade with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident care recipients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000[a]. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released [b].

(Portions of table not shown remain unchanged)

Reason: Consistency. The laundry list in the second bullet is exactly the same as the entire list of items that make up E Occupancies in 305. This just substitutes a defined term for a laundry list. My change has the added advantage of making it clearer that the 250 occupant load trigger applies to all, not just day care facilities.

The change in bullet 3 uses the words from 304. Current text says the same thing as in 304 but uses different words.. Additionally it relieves the code from deciding which college freshmen are adults.

This change also makes it clear that trade schools are covered .

Cost Impact: The code change proposal will not increase the cost of construction.

S83-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1604.5-S-STEWART

S84–12
1604.8.2

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

Revise as follows:

1604.8.2 Structural walls. Walls that provide vertical load-bearing resistance or lateral shear resistance for a portion of the structure shall be anchored to the roof and to all floors and members that provide lateral support for the wall or that are supported by the wall. The connections shall be capable of resisting the horizontal forces specified in Section 1.4.4 of ASCE 7 for walls of structures assigned to Seismic Design Category A and to Section 12.11 of ASCE 7 for walls of structures assigned to all other seismic design categories. Required anchors in masonry walls of hollow units or cavity walls shall be embedded in a reinforced grouted structural element of the wall. See Sections 1609 for wind design requirements and 1613 for earthquake design requirements.

<u>Exceptions:</u>

1. <u>In Risk Category I and II buildings or structures, connections for light-frame wood or cold-formed steel walls not exceeding 15 pounds per square foot (718 N/m2) in weight designed and constructed in accordance with Section 2304.9, Section 2308, or Section 2210.7 shall be exempt from the provisions of this section.</u>
2. <u>In Risk Category I and II buildings or structures assigned to Seismic Design Category A, B, or C, connections for light-frame wood or cold-formed steel walls with stone or masonry veneer not exceeding 48 pounds per square foot (2298 N/m2) in weight designed and constructed in accordance with Section 2304.9, Section 2308, or Section 2210.7, shall be exempt from the provisions of this section.</u>

Reason: The purpose of this amendment is to supply exceptions to the new wall anchorage provisions added in ASCE 7-10 and the 2012 IBC. These new provisions were much needed, and we supported their inclusion in ASCE 7. However, during the ASCE 7-10 development process the provisions were expanded to apply to all bearing walls including light frame walls. The result is to impose an unnecessary and unjustified light-frame wall design check on already-overburdened engineers. We are concerned this will be a "nuisance" provision; glossed over until the code official or peer reviewer calls an engineer on it. We are also concerned engineers using prescriptive fastener schedules such as those in the IBC, WFCM or COFS-PM will be asked to justify them. This amendment supplies two exemptions: (1) for light-frame walls less than 15psf in weight in any seismic design category; and (2) for veneered walls less than 48 psf in weight in seismic design categories A, B and C. This will reduce burdens on engineers and code officials applying the new provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

S84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1604.8.2-S-EHRLICH.doc

S85–12
1604.11 (NEW), 1604.11.1 (NEW), 1604.11.2 (NEW), 1615

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee

Revise as follows:

1604.11 Structural integrity. Structural integrity for buildings and other structures shall be provided in accordance with this section and shall not be less than specific applicable requirements elsewhere in this code.

1604.11.1 General. Buildings and other structures shall comply with Sections 1.4 through 1.4.5 of ASCE 7.

Exceptions:

1. Detached one- and two-family dwellings, assigned to *Seismic Design Category* A, B or C, or located where the mapped short-period spectral response acceleration, S_S, is less than 0.4 g.
2. The seismic-force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.

1604.11.2 High rise buildings classified as Risk Category III or IV. In addition to the requirements of Section 1604.11.1 high-rise buildings that are classified as Risk Category III or IV shall comply with Section 1615.

SECTION 1615
STRUCTURAL INTEGRITY OF HIGH-RISE RISK CATEGORY III AND IV BUILDINGS

(Portions of text not shown remains unchanged)

Reason: Since the IBC drafting stages, attempts have been made to add minimum general structural integrity requirements based on ASCE 7 Section 1.4. Those attempts have been rejected because the ASCE 7 provisions of Section 1.4 were considered to be unenforceable. With concerns that have been raised over requiring minimum general structural integrity, it was recognized that the Seismic Design Category (SDC) A requirements under earthquake loads constitute a "de facto" set of minimum structural integrity requirements that all structures must meet. Those minimum requirements would be exceeded in the case of higher seismic design categories.

The 2010 edition of ASCE 7 has, in fact, relocated the seismic design requirements for SDC A to Section 1.4 of the standard which is titled "General Structural Integrity". Section 1.4 of ASCE 7 is then referenced by Section 11.7 of the standard for minimum earthquake load and detailing requirements in SDC A. Section 11.7 states,

11.7 DESIGN REQUIREMENTS FOR SEISMIC DESIGN CATEGORY A

Buildings and other structures assigned to Seismic Design Category A need only comply with the requirements of Section 1.4. Nonstructural components in SDC A are exempt from seismic design requirements. In addition, tanks assigned to Risk Category IV shall satisfy the freeboard requirement in Section 15.7.6.1.2

The ASCE 7 seismic loading requirements are applied by reference from IBC **Section 1613.1, "EARTHQUAKE LOADS".** The intent is to ensure minimum structural design criteria by applying Section 1.4 of ASCE 7 to structures that are classified as SDC A under the 2012 IBC.

The proposed scope of reference does not include Section 1.4.6 of ASCE 7 which deals with extraordinary loads and events for which no specific criteria are provided.

Since the structural integrity requirements in Section 1.4 of ASCE 7 are implemented via the earthquake load provisions, the four exceptions currently in Section 1613.1 are copied here, verbatim, as Exceptions 2 through 5. This is done to avoid any unintended technical changes. In 1604.11.2 a cross-reference is added to the structural integrity requirements that are currently in Section 1615.

Since the new proposed section 1604.11 is titled "STRUCTURAL INTEGRITY", the title of the existing section 1615, "STRUCTURAL INTEGRITY", is changed to reflect the specific scope of that section which is High-rise risk category III and IV

Cost Impact: The code change proposal will not increase the cost of construction.

S85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1604.11 (NEW)-S-BAJNAI-BCAC.doc

S86–12
1605.2

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

1605.2 Load combinations using strength design or load and resistance factor design. Where strength design or load and resistance factor design is used, buildings and other structures, and portions thereof, shall be designed to resist the most critical effects resulting from the following combinations of factored loads:

$1.4(D + F)$	**(Equation 16-1)**
$1.2(D + F) + 1.6(L + H) + 0.5(L_r \text{ or } S \text{ or } R)$	**(Equation 16-2)**
$1.2(D + F) + 1.6(L_r \text{ or } S \text{ or } R) + 1.6H + (f_1L \text{ or } 0.5W)$	**(Equation 16-3)**
$1.2(D + F) + 1.0W + f_1L + 1.6H + 0.5(L_r \text{ or } S \text{ or } R)$	**(Equation 16-4)**
$1.2(D + F) + 1.0E + f_1L + 1.6H + f_2S$	**(Equation 16-5)**
$0.9D + 1.0W + 1.6H$	**(Equation 16-6)**
$0.9(D + F) + 1.0E + 1.6H$	**(Equation 16-7)**

where:

f_1 = 1 for places of public assembly live loads in excess of 100 pounds per square foot (4.79 kN/m2), and parking garages; and 0.5 for other live loads.

f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure, and 0.2 for other roof configurations.

Exceptions:

1. Where other factored load combinations are specifically required by other provisions of this code, such combinations shall take precedence.
2. Where the effect of H resists the primary variable load effect, a load factor of 0.9 shall be included with H where H is permanent and H shall be set to zero for all other conditions.
3. <u>Crane wheel loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load. Alternatively, industry standard reference documents citing additional crane load combinations shall be permitted for the design of buildings subject to horizontal and vertical crane loads.</u>

1605.3.1 Basic load combinations. Where *allowable stress design* (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$	**(Equation 16-8)**
$D + H + F + L$	**(Equation 16-9)**
$D + H + F + (Lr \text{ or } S \text{ or } R)$	**(Equation 16-10)**
$D + H + F + 0.75(L) + 0.75(L_r \text{ or } S \text{ or } R)$	**(Equation 16-11)**
$D + H + F + (0.6W \text{ or } 0.7E)$	**(Equation 16-12)**
$D + H + F + 0.75(0.6W) + 0.75L + 0.75(L_r \text{ or } S \text{ or } R)$	**(Equation 16-13)**
$D + H + F + 0.75\ (0.7\ E) + 0.75\ L + 0.75\ S$	**(Equation 16-14)**
$0.6D + 0.6W + H$	**(Equation 16-15)**
$0.6(D + F) + 0.7E + H$	**(Equation 16-16)**

Exceptions:

1. Crane ~~hook~~ wheel loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load. Alternatively, industry standard reference documents citing additional crane load combinations shall be permitted for the design of buildings subject to horizontal and vertical crane loads.
2. Flat roof snow loads of 30 psf (1.44 kN/m2) or less and roof live loads of 30 psf (1.44 kN/m2) or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m2), 20 percent shall be combined with seismic loads.
3. Where the effect of *H* resists the primary variable load effect, a load factor of 0.6 shall be included with *H* where *H* is permanent and *H* shall be set to zero for all other conditions.
4. In Equation 16-15, the wind load, *W*, is permitted to be reduced in accordance with Exception 2 of Section 2.4.1 of ASCE 7.
5. In Equation 16-16, 0.6 *D* is permitted to be increased to 0.9 *D* for the design of special reinforced masonry shear walls complying with Chapter 21.

1605.3.2 Alternative basic load combinations. In lieu of the basic load combinations specified in Section 1605.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. When using these alternative basic load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. When using allowable tresses which have been increased or load combinations which have been reduced as permitted by the material chapter of this code or the referenced standards, where wind loads are calculated in accordance with Chapters 26 through 31 of ASCE 7, the coefficient (ω) in the following equations shall be taken as 1.3. For other wind loads, (ω) shall be taken as 1. When allowable stresses have not been increased or load combinations have not been reduced as permitted by the material chapter of this code or the referenced standards, (ω) shall be taken as 1. When using these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning from Section 12.13.4 in ASCE 7 shall not be used. When using these alternative basic load combinations for proportioning foundations for loadings, which include seismic loads, the vertical seismic *load effect*, E_v, in Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero.

$D + L + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-17)**

$D + L + 0.6\ \omega W$ **(Equation 16-18)**

$D + L + 0.6\ \omega W + S/2$ **(Equation 16-19)**

$D + L + S + 0.6\ \omega W/2$ **(Equation 16-20)**

$D + L + S + E/1.4$ **(Equation 16-21)**

$0.9D + E/1.4$ **(Equation 16-22)**

Exceptions:

1. Crane ~~hook~~ wheel loads need not be combined with roof live loads or with more than three-fourths of the snow load or one-half of the wind load. Alternatively, industry standard reference documents citing additional crane load combinations shall be permitted for the design of buildings subject to horizontal and vertical crane loads.
2. Flat roof snow loads of 30 psf (1.44 kN/m2) or less and roof live loads of 30 psf (1.44 kN/m2) or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m2), 20 percent shall be combined with seismic loads.

Reason: Current code language does not completely or adequately address the issue of load combinations for the design of buildings with bridge cranes. This includes buildings and other structures that have multiple crane runways adjacent to one another and/or multiple cranes on the same runway. An exception pointing to industry standard reference documents, such as the Association of Iron and Steel Technology (AIST) "Technical Report No. 13 - Guide for the Design and Construction of Mill Buildings", allows the engineer to utilize such resources when determining additional load combinations that may control in the design of such buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

S86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1605.2-S-HUSTON

S87–12
202, Table 1607.1

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

Delete without substitution:

SECTION 202
DEFINITIONS

~~**MARQUEE.** A *canopy* that has a top surface which is sloped less than 25 degrees from the horizontal and is located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the marquee.~~

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND
MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
~~21. Marquees~~	~~75~~	-
26. Roofs		
All roof surfaces subject to maintenance workers		300
Awnings and canopies:		
Fabric construction supported by a skeleton structure	5 Nonreducible	
All other construction	20[n]	
Ordinary flat, pitched, and curved roofs (that are not occupiable)	20	
Where primary roof members are exposed to a work floor, at single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs:		
Over manufacturing, storage warehouses, and repair garages		2,000
All other primary roof members		300
Occupiable roofs:		
Roof gardens	100	
Assembly areas	100[m]	
All other similar areas	Note 1	Note 1

n Where a canopy has a top surface sloped less than 25 degrees from the horizontal and is located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the canopy, the minimum live load shall be taken as the live load of the adjacent room or space, but not less than 40psf. The maximum live load for canopies less than or equal to 100 square feet in area shall be 60psf.

(Portions of Table and footnotes not shown remain unchanged)

Reason: The purpose of this amendment is to revise the 2012 IBC language regarding canopies and marquees. The language approved for the 2012 IBC will substantially change the design requirements for many small porch and patio roofs on buildings nowhere near public streets. These roofs are currently designed for standard roof live loads or local ground snow loads (typically in the range of 20 or 30 pounds per square foot). These elements will now need to be designed for 75psf if they happen to be less than 10 feet vertically from a window above or horizontally from a window at the level of the canopy. This represents a substantial increase in design requirements for apartment or condominium complexes with these elements, as well as a substantial issue for renovations. This change deletes the definition for marquees in its entirety and transfers the language regarding canopy slope and ability to access the top surface from nearby openings to a footnote on the standard canopy live load. It also requires the window to be operable. The live load for the accessible canopy condition is set to the adjacent occupancy, with a minimum floor of 40psf (equivalent to the traditional load for a residential deck). To avoid effectively further raising the live load requirement from 75psf to 100psf for a small canopy accessible from an egress hallway or stair, a maximum live load of 60psf is established for canopies not exceeding 100 square feet in area (similar to what the traditional load cases were for residential balconies).

Cost Impact: The code change proposal will not increase the cost of construction.

S87-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1607.1-S-EHRLICH.doc

S88–12
Table 1607.1

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (Huston@smithhustoninc.com)

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND
MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs)
24.Recreational uses:		
Ice Skating Rink	250[m]	See Section 1607.7.4
Roller Skating Rink	100[m]	

m. Live load reduction is not permitted unless specific exceptions of Section 1607.10 apply.

(Portions of Table and footnotes not shown remain unchanged)

Reason: : Uniformly distributed live load for rinks were in previous editions of the IBC. They were removed from the IBC 2009, as part of a larger CCP. The intent of this code change proposal is to once again list the recommended minimum uniform live load for rinks back into IBC. The proposed loads are consistent with the recommendations in ASCE7 commentary for minimum uniformly distributed live load.

Cost Impact: The code change proposal will not increase the cost of construction.

S88-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1607.1-S-HUSTON.doc

S89–12
1607.5

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

1607.5 Partition loads. In office buildings and in other buildings where partition locations are subject to change, provisions for partition weight shall be made, whether or not partitions are shown on the *construction documents*, unless the specified live load ~~exceeds~~ <u>is</u> 80 psf (3.83 kN/m^2) <u>or greater</u>. The partition load shall not be less than a uniformly distributed live load of 15 psf (0.72 kN/m^2).

Reason: IBC Table 1607.1, item #22 requires a live load of 80 psf for corridors above the first floor. It is a common practice to design an entire floor for an 80 psf live load, and thereby not need to worry about the locations of the corridors, or whether the corridor locations may be moved in the future. The way the code is written now, a floor would have to be designed for a live load of 81 psf (it must "exceed" 80 psf) to be able to take advantage of the exception written into section 1607.5. Otherwise one has to add a 15 psf partition load on top of an 80 psf corridor live load.

This change does not alter the requirements of ASCE 7, section 12.7.2 Effective Seismic Weight, #2 (the greater of 10 psf or the actual weight of the partitions must be used for calculating the seismic weight of a building).

Cost Impact: The code change proposal will not increase the cost of construction.

S89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.5-S-HUSTON.doc

S90–12

901.5, 1004.3, 1607.7.2, 1703.4.1, 1703.6, 1703.6.1, 17042, 1704.2.4, 1704.4, 1704.5, 1707.1, 1803.6, 2211.3.3, 2303.4.1.3, 3306.8, 3401.2, G104.1, J106.1, K102.3

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

THIS IS A FOUR PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

PART I – IBC STRUCTURAL

Revise as follows:

1607.7.5 Posting. The maximum weight of the vehicles allowed into or on a garage or other structure shall be posted by the owner <u>or the owner's authorized agent</u> in accordance with Section 106.1.

1703.4.1 Research and investigation. Sufficient technical data shall be submitted to the *building official* to substantiate the proposed use of any material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the *building official* shall approve the use of the material or assembly subject to the requirements of this code. The costs, reports and investigations required under these provisions shall be paid by the ~~applicant~~ <u>owner or the owner's authorized agent</u>.

1703.6 Evaluation and follow-up inspection services. Where structural components or other items regulated by this code are not visible for inspection after completion of a prefabricated assembly, the ~~applicant~~ <u>owner or the owner's authorize agent</u> shall submit a report of each prefabricated assembly. The report shall indicate the complete details of the assembly, including a description of the assembly and its components, the basis upon which the assembly is being evaluated, test results and similar information and other data as necessary for the *building official* to determine conformance to this code. Such a report shall be *approved* by the *building official*.

1703.6.1 Follow-up inspection. The ~~applicant~~ <u>owner or the owner's authorized agent</u> shall provide for *special inspections* of fabricated items in accordance with Section 1704.2.5.

1704.2 Special inspections. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's <u>authorized</u> agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section 1705. These inspections are in addition to the inspections identified in Section 110.

Exceptions:

1. *Special inspections* are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
3. Special inspections are not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.

1704.2.4 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the ~~applicant and~~ owner or the owner's authorized agent to the *building official*.

1704.4 Contractor responsibility. Each contractor responsible for the construction of a main wind- or seismic force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the *building official,* and the owner or the owner's authorized agent, prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgement of awareness of the special requirements contained in the statement of *special inspection*.

1704.5 Structural observations. Where required by the provisions of Section 1704.5.1 or 1704.5.2, the owner or the owner's authorized agent shall employ a *registered design professional* to perform structural observations as defined in Section 1702. Prior to the commencement of observations, the structural observer shall submit to the *building official* a written statement identifying the frequency and extent of structural observations. At the conclusion of the work included in the permit, the structural observer shall submit to the *building official* a written statement that the site visits have been made and identify any reported deficiencies ~~which~~ that, to the best of the structural observer's knowledge, have not been resolved.

1707.1 General. In the absence of *approved* rules or other *approved* standards, the *building official* shall make, or cause to be made, the necessary tests and investigations; or the *building official* shall accept duly authenticated reports from *approved agencies* in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.11. The cost of all tests and other investigations required under the provisions of this code shall be borne by the ~~applicant~~ owner or the owner's authorized agent.

Revise as follows:

1803.6 Reporting. Where geotechnical investigations are required, a written report of the investigations shall be submitted to the *building official* by the ~~owner or authorized agent~~ permit applicant at the time of *permit* application. This geotechnical report shall include, but need not be limited to, the following information:

1. A plot showing the location of the soil investigations.
2. A complete record of the soil boring and penetration test logs and soil samples.
3. A record of the soil profile.
4. Elevation of the water table, if encountered.
5. Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strength; and the effects of adjacent loads.
6. Expected total and differential settlement.
7. Deep foundation information in accordance with Section 1803.5.5.
8. Special design and construction provisions for foundations of structures founded on expansive soils, as necessary.
9. Compacted fill material properties and testing in accordance with Section 1803.5.8.
10. Controlled low-strength material properties and testing in accordance with Section 1803.5.9.

Revise as follows:

2211.3.3 Trusses spanning 60 feet or greater. The owner <u>or the owner's authorized agent</u> shall contract with a *registered design professional* for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/ bracing for trusses with clear spans 60 feet (18 288 mm) or greater. *Special inspection* of trusses over 60 feet (18 288 mm) in length shall conform to Section 1705.

2303.4.1.3 Trusses spanning 60 feet or greater. The owner <u>or the owner's authorized agent</u> shall contract with any qualified *registered design professional* for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing for all trusses with clear spans 60 feet (18 288 mm) or greater.

G104.1 Required. Any person, owner or <u>owner's</u> authorized agent who intends to conduct any development in a flood hazard area shall first make application to the *building official* and shall obtain the required *permit*.

J106.1 Maximum slope. The slope of cut surfaces shall be no steeper than is safe for the intended use, and shall be no steeper than two units horizontal to one unit vertical (50-percent slope) unless the owner or <u>the owner's</u> authorized agent furnishes a geotechnical report justifying a steeper slope.

Exceptions:

1. A cut surface shall be permitted to be at a slope of 1.5 units horizontal to one unit vertical (67-percent slope) provided that all of the following are met:
   1.1. It is not intended to support structures or surcharges.
   1.2. It is adequately protected against erosion.
   1.3. It is no more than 8 feet (2438 mm) in height.
   1.4. It is approved by the building code official.
   1.5. Ground water is not encountered.
2. A cut surface in bedrock shall be permitted to be at a slope of one unit horizontal to one unit vertical (100-percent slope).

K102.3 Maintenance. Electrical systems, equipment, materials and appurtenances, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe, hazard-free condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which installed. The owner or the owner's ~~designated~~ <u>authorized</u> agent shall be responsible for the maintenance of the electrical systems and equipment. To determine compliance with this provision, the *building official* shall have the authority to require that the electrical systems and equipment be re-inspected.

PART II – IBC GENERAL

Revise as follows:

3306.8 Repair, maintenance and removal. Pedestrian protection required by this chapter shall be maintained in place and kept in good order for the entire length of time pedestrians are subject to being endangered. The *owner* or the *owner's* <u>authorized</u> agent, upon the completion of the construction activity, shall immediately remove walkways, debris and other obstructions and leave such public property in as good a condition as it was before such work was commenced.

3401.2 Maintenance. Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's ~~designated~~ <u>authorized</u> agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this subsection, the *building official* shall have the authority to require a building or structure to be reinspected. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures.

PART III – IBC FIRE SAFETY

Revise as follows:

901.5 Acceptance tests. *Fire protection systems* shall be tested in accordance with the requirements of this code and the *International Fire Code*. When required, the tests shall be conducted in the presence of the *building official*. Tests required by this code, the *International Fire Code* and the standards listed in this code shall be conducted at the expense of the owner or the owner's ~~representative~~ authorized agent. It shall be unlawful to occupy portions of a structure until the required *fire protection systems* within that portion of the structure have been tested and *approved*.

PART IV – IBC MEANS OF EGRESS

Revise as follows:

1004.3 Posting of occupant load. Every room or space that is an assembly occupancy shall have the *occupant load* of the room or space posted in a conspicuous place, near the main *exit* or *exit access doorway* from the room or space. Posted signs shall be of an *approved* legible permanent design and shall be maintained by the owner or the owner's authorized agent.

Reason: The purpose for the proposal is to update the references to "applicant" and "owner" throughout the building code by changing them to the "owner or the owner's authorized agent" where it is warranted. In conjunction with this proposal there are also changes to Chapter 1 and 2, which are in a separate proposal that will be heard by the Administration Committee. In Sections 1703.4.1 and 1707.1, "the applicant" is changed to "the owner or the owner's authorized agent" because the latter should be responsible for the costs of required tests, reports and investigations. In Sections 1703.6 and 1704.2.4, "the applicant" is changed to "the owner or the owner's authorized agent" because the latter should be responsible for submitting required reports to the building official. In Section 1703.6.1, the applicant" is changed to "the owner or the owner's authorized agent" for consistency with Section 1704.2 that requires the latter to employ the approved agencies. In Section 1803.6, the "owner or authorized agent" is changed to the "permit applicant" because it should be permissible for the latter to submit the geotechnical report with the other submittal documents at the time of permit application.

The 2012 IBC contains additional references to "owner" but, based on the context in which they are used, it is not considered appropriate or useful to revise the language in conjunction with this proposal (e.g., from "the owner" to "the owner or the owner's authorized agent"). See Sections 101.4.4, 104.6, 111.2, 112.3, 116.3, 116.4, 402.3, 913.4, 1107.4-Exc. 1, 1607.7.4, 3108.2, 3307.1, 3412.4, 3412.4.1, G101.2, G105.6-Item 3, K103.1 and L101.3.

The 2012 IBC contains additional references to "applicant" but, based on the context in which they are used, it is also not considered appropriate or useful to revise the language in conjunction with this proposal (e.g., from "the applicant" to "the owner or the owner's authorized agent"). See Sections 104.10.1-Item 5, 105.1.1, 105.3, 107.3.1, 109.3, 109.5, 1612.3.1, 1612.3.2, 1704.2.3, 1704.3, G103.3, G103.4, G103.5.1, G103.6, G104.2, G105.7-Item 5 and J104.1.

All instances in the 2012 IBC of "applicant" and "owner," other than listed above, are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

S90-12
PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE - GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – INTERNATIONAL BUILDING CODE – FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – INTERNATIONAL BUILDING CODE – MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.7.5-S-BRAZIL.doc

S91–12
1607.7, 1607.7.1, 1607.7.3

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

Revise as follows:

1607.7 Heavy vehicle loads. Floors and other surfaces that are intended to support vehicle loads greater than a ~~10,000 pound (4536 kg)~~ 12,000 pound (5443 kg) gross vehicle weight rating shall comply with Sections 1607.7.1 through 1607.7.5.

1607.7.1 Loads. Where any structure does not restrict access for vehicles that exceed a ~~10,000-pound (4536 kg)~~ 12,000 pound (5443 kg) gross vehicle weight rating, those portions of the structure subject to such loads shall be designed using the vehicular live loads, including consideration of impact and fatigue, in accordance with the codes and specifications required by the jurisdiction having authority for the design and construction of the roadways and bridges in the same location of the structure.

1607.7.3 Heavy vehicle garages. Garages designed to accommodate vehicles that exceed a ~~10,000 pound (4536 kg)~~ 12,000 pound (5443 kg) gross vehicle weight rating, shall be designed using the live loading specified by Section 1607.7.1. For garages the design for impact and fatigue is not required.

> **Exception:** The vehicular live loads and load placement are allowed to be determined using the actual vehicle weights for the vehicles allowed onto the garage floors, provided such loads and placement are based on rational engineering principles and are approved by the building official, but shall not be less than 50 psf (2.9 kN/m^2). This live load shall not be reduced.

Reason: The purpose of this amendment is to revise the minimum Gross Vehicle Weight Rating (GVWR) necessary to trigger the new heavy vehicle load design provisions approved for the 2012 IBC. The original intent was to address the design of floors and other surfaces needing to support the weight of commercial trucks, buses, fire engines and other large vehicles. It certainly makes sense for a garage or plaza accessible to these large vehicles to be designed for higher loads. However, during the code development process, a 10,000 pound GVWR trigger was added for the special design requirements, unless the owner posts a weight limit. The problem is that many common pick-up trucks and minivans have GVWR's exceeding 10,000 pounds; for example, the Chevy Silverado 3500 (11,400 pounds for the 2006 & 2007 editions), Dodge Ram 3500 (11,000 pounds for the 2006-2008 editions), or Ford F-350 (10,100 pounds for the 2006-2008 editions). Thus, the 2012 IBC language could negatively affect multifamily and mixed-use projects with garages or plazas accessible to these common vehicles. An owner may decide it is not worth the cost to design his garage to the local bridge and highway design standards mandated by the provisions, in which case they would have to post a weight limit and tell residents and visitors they can't park pickup trucks and minivans in the garage. This amendment raises the trigger to a 12,000 pound GVWR, which would clear all of the large pickup trucks and minivans commonly used as individual and family passenger vehicles.

Cost Impact: The code change proposal will not increase the cost of construction.

S91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.7-S-EHRLICH.doc

S92–12
1607.9.3 (NEW)

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc, representing self

Add new text as follows:

1607.9.3 Elements supporting hoists for façade access equipment: In addition to any other applicable live loads, structural elements that support hoists for façade access equipment shall be designed for a live load consisting of the larger of the rated load of the hoist times 2.5 and the stall load of the hoist.

Reason: Historically, the code has been silent on structural requirements for elements that support facade access equipment, such as swing stages and window washing platforms. The Occupational Safety & Health Administration (OSHA) requires that facade access platforms be designed for four to four-and-a-half times the rated load of the suspended platform. Another OSHA requirement is that the platforms should be designed for one-and-a-half times the stall load of the hoist (this applies to platforms that are used for painting and hanging signs or holiday lights as well as other construction activities). Although OSHA requirements are not written in either code language or engineering language, this proposed change closely matches OSHA requirements for suspended platforms. Using a design live load of 2.5 times the rated load, when combined with a live load factor of 1.6, results in a total factored load of 4.0 times the rated load, which matches OSHA's requirements for scaffolds used for building maintenance. Although this overall factor might appear excessive, it is intended by OSHA to address accidental hang-up-and-fall scenarios as well as starting and stopping forces that the platforms experience on a day-to-day basis.

Designing for the stall load of the hoist also makes sense, because suspended platforms can get hung up while ascending, generating forces much larger than the rated load of the platform or hoist. If the stall cut-off is working properly, the stall load should be the maximum load that can be delivered to the structural elements supporting the hoist. The load factor of 1.6 typically associated with live loads should safely accommodate variability in the stall load cut-off mechanism, and provides a factored load that closely matches the requirements of OSHA for facade access platforms that are used for construction activities.

These loads have been missing from the building code for far too long and many engineers do not even know that there are specific design requirements for these elements; these are important loads and need to be provided in the building code.

Cost Impact: The code change proposal will not increase the cost of construction.

S92-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.9.3 #1-S-SEARER.doc

S93–12
1607.9.3 (NEW)

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing self

Add new text as follows:

1607.9.3 Lifeline anchorages for façade access equipment: In addition to any other applicable live loads, lifeline anchorages and structural elements that support lifeline anchorages shall be designed for a live load of at least 3100 pounds (13.8 kN) per attached lifeline, in every direction that a fall arrest load may be applied.

Reason: Historically, the code has been silent on structural requirements for elements that support lifelines used to safely access the facades of buildings.

The Occupational Safety & Health Administration (OSHA) requires that lifeline anchorages be designed for an ultimate load of at least 5,000 pounds per attached person. Although OSHA requirements are not written in either code language or engineering language, this proposed change closely matches OSHA requirements for lifeline anchorages. Using a design live load of 3,100 pounds, when combined with a live load factor of 1.6, results in a total factored load of 4,960 pounds, which essentially matches OSHA's requirements for lifeline anchorages. Although this load might appear excessive, it is intended by OSHA to address the fall arrest loads that can and do reasonably occur in typical lanyards for body harnesses, and which are highly variable. OSHA allows stopping forces as high as 2540 pounds to be generated by a person free-falling six feet. Since sometimes people weigh more than the weight assumed by OSHA, since sometimes people may fall more than six feet, and since the lifeline anchorages are used if something has gone wrong with the primary suspension system (and thus represents the user's last hope of avoiding a potentially fatal fall), the effective factor of safety of two -- from an ideal design load of 2540 pounds to an ultimate design load of 5,000 pounds -- is what OSHA deems necessary to provide an acceptable level of safety.

These loads have been missing from the building code for far too long and many engineers do not even know that there are specific design requirements for these elements; these are important loads and need to be provided in the building code.

Cost Impact: The code change proposal will not increase the cost of construction.

S93-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.9.3 #2-S-SEARER.doc

S94–12
1607.10.2

Proponent: Gary R. Searer/Wiss, Janney, Elstner Associates, Inc., representing self

Revise as follows:

1607.10.2 Alternative uniform live load reduction. As an alternative to Section 1607.10.1 and subject to the limitations of Table 1607.1, uniformly distributed live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m^2) except that the design live load for members supporting two or more floors is permitted to be reduced by a maximum of 20 percent.

   Exception: For uses other than storage, where *approved*, additional live load reductions shall be permitted where shown by the *registered design professional* that a rational approach has been used and that such reductions are warranted.

2. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.
3. For live loads not exceeding 100 psf (4.79 kN/m^2), the design live load for any structural member supporting 150 square feet (13.94 m^2) or more is permitted to be reduced in accordance with Equation 16-24.
4. For one-way slabs, the area, *A*, for use in Equation 16-24 shall not exceed the product of the slab span and a width normal to the span of 0.5 times the slab span.

$R = 0.08(A – 150)$ **(Equation 16-24)**

For SI: $R = 0.861(A – 13.94)$

Such reduction shall not exceed the smallest of:

1. 40 percent for ~~horizontal~~ members <u>supporting one floor</u>;
2. 60 percent for ~~vertical~~ members <u>supporting two or more floors</u>; or
3. *R* as determined by the following equation.

$R = 23.1(1+ D/L_o)$ **(Equation 16-25)**

where:

A = Area of floor supported by the member, square feet (m^2).
D = Dead load per square foot (m^2) of area supported.
L_o = Unreduced live load per square foot (m^2) of area supported.
R = Reduction in percent.

Reason: The alternate live load reductions contained in Section 1607.9.2 originated in the Uniform Building Code and were the primary live load reduction formulas used in the western United States for decades. When the live load reductions were brought into the IBC, they were incorporated as an alternate to Section 1607.9.1. During the incorporation of these reductions into the IBC, the maximum reductions were changed from "40 percent for members receiving load from one level only" and "60 percent for other members" (in the 1997 UBC) to the current 40/60 differentiation between horizontal and vertical members. This current differentiation does not match the original wording (because some horizontal members receive live load from more than one floor and because many vertical elements do not receive live load from more than one floor) and does not match the differentiation in Section 1607.9.1, which, like the UBC, differentiates reductions based on whether a member supports one floor or more than one floor: "L shall not be less than $0.50L_o$ for members supporting one floor and L shall not be less than $0.40L_o$ for members supporting two or more floors." The premise behind differentiating between supporting one floor or more than one floor is basically probability-based, and reasonably assumes that the probability that two or more floors are experiencing a relatively large live load is smaller than that of a single floor experiencing a relatively large live load; hence the larger reduction for elements that support more than one floor. The same premise cannot be said of differentiating live load reductions based on horizontality or verticality of the element under consideration.

Since basing allowable live load reductions on number of floors supported as opposed to whether a member is horizontal or vertical makes more sense, this proposal restores the original intent of the UBC provision and brings the provision into better alignment with Section 1607.9.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.9.2-S-SEARER.doc

S95–12
1607.12.3.1, Chapter 35 (NEW)

Proponent: Jonathan Siu, City of Seattle, Department of Planning & Development (jon.siu@seattle.gov), Mark S. Graham, National Roofing Contractors Association

Revise as follows:

1607.12.3.1 Landscaped roofs. ~~The uniform design live load in unoccupied landscaped areas on roofs shall be 20 psf (0.958 kN/m^2).~~ The weight of all landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil <u>as determined in accordance with ASTM E 2397. The uniform design live load in unoccupied landscaped areas on roofs shall be 20 psf (0.958 kN/m^2). The uniform design live load for occupied landscaped areas on roofs shall be determined in accordance with Table 1607.1.</u>

Add new standard to Chapter 35 as follows:

ASTM

<u>E 2397-11 – Standard Practice for Determination of Dead Loads and Live Loads Associated with Green Roof Systems</u>

Reason: ASTM E 2397 is the standard for how to determine the dead load of soils. This is being inserted in the IBC to coordinate with the IGCC, which has many provisions regarding landscaped roofs (aka “vegetative roofs”). This proposal addresses a gap in the regulations, providing an appropriate standard for addressing soil loads. The other changes are editorial:

- The weight of landscaping materials applies to all landscaped roofs, and therefore is more appropriate at the beginning of the paragraph.

Adding the reference to Table 1607.1 for occupied landscaped areas is for clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.11.3.1-S-GRAHAM-SIU.doc

S96–12
1607.14, 1607.14.1

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee (Huston@smithhustoninc.com)

Revise as follows:

1607.14 Interior walls and partitions. Interior walls and partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength to resist the loads to which they are subjected but not less than a horizontal load of 5 psf (0.240 kN/m^2).

> ~~**Exception:** Fabric partitions complying with Section 1607.14.1 shall not be required to resist the minimum horizontal load of 5 psf (0.24 kN/m^2).~~

1607.14.1 Fabric partitions. Fabric partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength to resist the following load conditions:

1~~.~~ ~~A horizontal distributed load of 5 psf (0.24 kN/m^2)~~ The horizontal distributed load need only be applied to the partition framing. The total area used to determine the distributed load shall be the area of the fabric face between the framing members to which the fabric is attached. The total distributed load shall be uniformly applied to such framing members in proportion to the length of each member.
2. A concentrated load of 40 pounds (0.176 kN) applied to an 8-inch diameter (203 mm) area [50.3 square inches (32 452 mm^2)] of the fabric face at a height of 54 inches (1372 mm) above the floor.

Reason: Section 1607.14.1, which is limited to only fabric partitions, restates the loading criteria found in Section 1607.14. Since the 5psf loading for partitions under 1604.14 the load is also applicable to fabric partitions. Having the exception to Section 1607.14 is redundant and not necessary

Cost Impact: The code change proposal will not increase the cost of construction.

S96-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1607.14-S-HUSTON.doc

S97–12
1609.1.1, Chapter 35 (NEW)

Proponent: Ray C. Minor, P.E., Hapco, representing self (ray.minor@hapco.com)

Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the ultimate design wind speed, *Vult*, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with Chapter 31 of ASCE 7.
7. Luminaire support structures designed in accordance with AASHTO LTS-5.

The wind speeds in Figures 1609A, 1609B and 1609C are ultimate design wind speeds, *Vult*, and shall be converted in accordance with Section 1609.3.1 to nominal design wind speeds, *Vasd*, when the provisions of the standards referenced in Exceptions 1 through 5 and 7 are used.

Add new standard to Chapter 35 as follows:

AASHTO

American Association of State Highway and Transportation Officials
444 North Capitol Street, NW Suite 249
Washington, DC 20001

LTS-5 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals

Reason: AASHTO LTS-5 is based on much research and many years of experience in using primarily pole type structures to support signs, luminaires and traffic signals along roadways. These type structures are also used for non-roadway applications such as sports lighting and parking lot lighting which may fall under the jurisdiction of the IBC. AASHTO LTS-5 incorporates the results of wind tunnel tests specific to shapes of these structures and the equipment they support. The wind pressure calculations are based on ASCE-7 except with some refinements such as more detailed drag coefficients. Stadium lighting poles involved in several recent failures would not meet the fatigue requirements of AASHTO LTS-5 primarily because the base plates were too thin. These failures most likely would not have occurred if the poles were designed to AASHTO LTS-5.

AASHTO LTS-5 is developed by an AASHTO committee with a consensus procedure.

There are other exceptions as precedents for this exception, including similar specifications for flagpoles and communications antennae. The flagpole specification NAAMM 1001 Guide Specification for Design of Metal Flagpoles includes flag wind load equations but otherwise uses the AASHTO LTS-5 procedures for flagpoles

Cost Impact: The code change proposal will not increase the cost of construction.

S-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1609.1.1-S-MINOR

S98–12
1609.1.1, 1609.3.1

Proponent: Randall Shackelford, P.E., Simpson Strong-Tie Company, Inc. (rshackelford@strongtie.com)

Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the ultimate design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with Chapter 31 of ASCE 7.

The wind speeds in Figures 1609A, 1609B and 1609C are ultimate design wind speeds, V_{ult}, and shall be converted in accordance with Section 1609.3.1 to nominal design wind speeds, V_{asd}, when the provisions of the standards referenced in Exceptions ~~1~~ 3 through 5 are used.

1609.3.1 Wind speed conversion. When required, the ultimate design wind speeds of Figures 1609A, 1609B and 1609C shall be converted to nominal design wind speeds, V_{asd}, using Table 1609.3.1 or Equation 16-33.

$$V_{asd} = V_{ult}\sqrt{0.6}$$ **(Equation 16-33)**

where:

V_{asd}= nominal design wind speed applicable to methods specified in Exceptions ~~1~~ 3 through 5 of Section 1609.1.1 and other standards not based on ultimate wind speeds.
V_{ult}= ultimate design wind speeds determined from Figures 1609A, 1609B or 1609C.

Reason: The 2012 WFCM, as referenced in Exception 2 above, is based on Ultimate Wind Speeds, V_{ult}, and therefore does not require conversion of the ultimate wind speed to the nominal wind speed, V_{asd}.
Further, the WFCM is the reference standard for wood framing in the ICC-600, so conversion should not take place when using ICC-600 to design wood framing. A committee has been appointed to revise ICC-600, and this code change is written assuming that the basis of ICC-600 will be changed to V_{ult} windspeeds, with conversion factors in the standard for converting to V_{asd} where needed. If by the Public Comment deadline it is not clear that this will be the case, I will prepare a Public Comment to restore Exception 1 to the list of items where conversion is required.

If this code change is not approved, structures designed using the 2012 WFCM with converted windspeeds will be designed for pressures that are only 60% of the pressures they should be designed for.

Section 1609.3.1 needs to be revised for similar reasons. Also, there are other building materials that require testing to "nominal" windspeeds, such as composition shingles in Section 1507.2.7.1. So nominal wind speeds, V_{asd}, is not just used in the Exceptions to 16009.1.1.

Cost Impact: This is not really a fair question for this code change. Yes, there will be a cost impact, because it would definitely be cheaper to design to wind loads that are 40% too low. But you don't want to do that.

S98-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1609.1.1-S-SHACKELFORD.doc

S99–12

1609.1.2

Proponent: Edward L. Keith, P.E., APA – The Engineered Wood Association (ed.keith@apawood.org)

Revise as follows:

1609.1.2 Protection of openings. In *wind-borne debris regions*, glazing in buildings shall be impact resistant or protected with an impact-resistant covering meeting the requirements of an *approved* impact-resistant standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the large missile test of ASTM E 1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the small missile test of ASTM E 1996.

Exceptions:

1. Wood structural panels with a minimum thickness of $^{7}/_{16}$ inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in ~~one- and two-story buildings~~ buildings with a mean roof height of 33 feet or less classified as Group R-3 or R-4 occupancy. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion-resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where V_{asd} determined in accordance with Section 1609.3.1 does not exceed 140 mph (63 m/s).
2. Glazing in *Risk Category* I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in *Risk Category* II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

Reason: In the early days of the development of the SBCCI Deemed-to-Comply document (The precursor to the SBCCI Standard for Hurricane Resistant Residential Construction, SSTD-10, and ultimately the ICC Standard for Residential Construction in High Wind Regions, ICC 600), limits were developed to the geometry of the structures covered by the standard. These limits included a height limit of 33 feet mean roof height. The 33 feet was based on then-current height zoning regulations, the referenced wind speed height in the contemporary ASTM wind standard, as well as height of most anemometers (wind measuring devices). As the Deemed-to-Comply and later documents were limited for wood buildings to two stories in height and as the standards evolved, the height limit was changed from 33 feet mean roof height to simply two stories. Note that the information in the code is based on a mean roof height of 33 feet and NOT two stories. APA developed this information and it is based on 33 feet mean roof height. (APA Form Number T450, free PDF download at apawood.org.)

From a wind perspective, only the geometry of the structure matters. Its internal make-up of floors and walls affect the *resistance* of the structure to the wind but has no impact on the load on the structure. The reason for this change is that the “two story-only” requirement puts artificial limitations on the use of the shutter provisions. This requirement has been used to limit the use of the shutter provisions from 3-story residential structures built on sloped surfaces or with the first story partially embedded in the ground. In either of the cases, the mean roof height may be 33 feet or less.

From the building geometry perspective, the two-story house could be such that the mean roof height exceeds 33 feet. This would make the analytical basis for the shutter design incorrect.

Note that there is no conflict with this proposal and the references to 30 feet in the body of Section 1609.1.2. These provisions are measurements to the glazed openings and are still appropriate with a mean main roof height of 33 feet.

The provisions in the code were originally based on a mean roof height of 33 feet. The shift to two-story was an unfortunate attempt at simplifying the provisions of the early high-wind prescriptive publications. Approval of this change will correct an unintended consequence of this attempt at simplification. Please vote for approval of this provision.

Cost Impact: The code change proposal will not increase the cost of construction.

S99-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1609.1.2-S-KEITH.doc

S100–12
1609.1.1, Chapters 35 (NEW)

Proponent: Jennifer Goupil, P.E., The Structural Engineering Institute of ASCE, representing self (jgoupil@asce.org)

Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the ultimate design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with ~~Chapter 31 of ASCE 7~~ <u>ASCE 49 and with Sections 31.4 and 31.5 of ASCE 7</u>.

The wind speeds in Figures 1609A, 1609B and 1609C are ultimate design wind speeds, V_{ult}, and shall be converted in accordance with Section 1609.3.1 to nominal design wind speeds, V_{asd}, when the provisions of the standards referenced in Exceptions 1 through 5 are used.

Add new standard to Chapter 35 as follows:

ASCE/SEI

<u>49-07 Wind Tunnel Testing for Buildings and Other Structures</u>

Reason: This change proposes to add the new referenced standard *ASCE 49 Wind Tunnel Testing for Buildings and Other Structures.* This standard provides minimum requirements for wind-tunnel tests to determine wind loads on and responses of buildings and other structures. Loads considered in this standard are wind loads for main wind-force resisting systems and for individual structural components and cladding of buildings and other structures. Loads produced by these tests are suitable for use in building codes and standards.

Provisions of this standard satisfy the requirements for wind-tunnel testing of the ASCE Standard *ASCE 7, Minimum Design Loads for Buildings and Other Structures*. Wind-tunnel testing has the capability to perform measurements beyond those specifically addressed in this standard, including pedestrian wind evaluations, dispersion of airborne pollutants, fugitive particulates, and wind energy siting studies. These studies are permitted to be included within the test report addressing wind loads.

Limited by the scope of ASCE 49, ASCE 7 Sections 31.4 Load Effects and ASCE 7 Section 31.5 Wind-Borne Debris are still essential for determining wind loads and are retained by this proposal.

ASCE/SEI 49 is published and maintained by the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE). The document is a nationally recognized consensus standard developed in full compliance with the ASCE *Rules for Standards Committees*. The ASCE standards process is fully accredited by the American National Standards Institute (ANSI).

The ASCE 49 committee developed the Standard in coordination with the ASCE 7 Wind Loads Subcommittee with the expectation that the ASCE 7 subcommittee will fully adopt ASCE 49. Further, the ASCE 49 standard is expected to be considered for adopted by reference by the ASCE 7 Main Committee during the next revision cycle.

As of the submission date of this code change proposal, the Standard is currently being published by ASCE. The document is designated ASCE 49 *Wind Tunnel Testing for Buildings and Other Structures* it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in October of 2012. Any person interested in obtaining a public comment copy of ASCE/SEI 49-07 may do so by contacting the proponent at jgoupil@asce.org. A copy of the standard has been submitted with this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S100-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1609.1-S-GOUPIL.doc

S101–12
1609.5.2

Proponent: Mark S. Graham, National Roofing Contractors Association (mgraham@nrca.net)

Revise as follows:

1609.5.2 Roof coverings. Roof coverings shall comply with Section 1609.5.1.

Exceptions:

1. Rigid tile roof coverings that are air permeable and installed over a roof deck complying with Section 1609.5.1 are permitted to be designed in accordance with Section 1609.5.3.
2. Asphalt shingles installed over a roof deck complying with Section 1609.5.1 shall comply with he wind-resistance requirements of Section 1507.2.7.1.

Reason: This code change proposal is intended to clarify the intent of the Code.

Section 1609.5.2 currently has an exception applicable to rigid tile roof coverings and asphalt shingles separately. As currently formatted--as two continuous paragraphs--the intent of these items can be easily misconstrued.

This proposed code change separates these two paragraphs into two separate numbered items, clarifying their intent. This change is not intended to change the Code's current technical requirements for rigid tile or asphalt shingles roofs.

Cost Impact: The code change proposal will not increase the cost of construction.

S101-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1609.5.2-S-GRAHAM.doc

S102–12

202 (NEW), 1403.7, 1603.1.7, 1612.4, 1612.5, G103.7, G301.2, G401.2; IPC 309.3; IMC 301.16.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Add new text as follows:

SECTION 202
DEFINITIONS

COASTAL A ZONE. Area within a special flood hazard area, landward of a V zone or landward of an open coast without mapped V Zones. In a coastal A zone, the principal source of flooding must be astronomical tides, storm surges, seiches, or tsunamis, not riverine flooding. During the base flood conditions, the potential for breaking wave height shall be greater than or equal to 1.5 ft. The inland limit of the coastal A zone is (a) the Limit of Moderate Wave Action if delineated on a FIRM, or (b) designated by the authority having jurisdiction.

LIMIT OF MODERATE WAVE ACTION. Line that may be shown on FIRMs to indicate the inland limit of the 1.5-foot wave height during the base flood.

Revise as follows:

1403.7 Flood resistance for high-velocity wave action areas and coastal A zones. For buildings in flood hazard areas subject to high-velocity wave action and coastal A zones as established in Section 1612.3, electrical, mechanical and plumbing system components shall not be mounted on or penetrate through exterior walls that are designed to break away under flood loads.

Revise as follows:

1603.1.7 Flood design data. For buildings located in whole or in part in *flood hazard areas* as established in Section 1612.3, the documentation pertaining to design, if required in Section 1612.5, shall be included and the following information, referenced to the datum on the community's Flood Insurance Rate Map (FIRM), shall be shown, regardless of whether flood loads govern the design of the building:

1. In *flood hazard areas* not subject to high-velocity wave action or coastal A zones, the elevation of the proposed lowest floor, including the basement.
2 In *flood hazard areas* not subject to high-velocity wave action or coastal A zones, the elevation to which any nonresidential building will be dry flood proofed.
3. In *flood hazard areas* subject to high-velocity wave action or coastal A zones, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including the basement.

1612.4 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including flood hazard areas subject to high-velocity wave action and coastal A zones, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.

1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*:

1. For construction in *flood hazard areas* not subject to high-velocity wave action or coastal A zones:

1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3.

1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1 of ASCE 24, c*onstruction documents* shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24.

1.3. For dry floodproofed nonresidential buildings, *construction documents* shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.

2. For construction in flood hazard areas subject to high-velocity wave action <u>and coastal A zones</u>:

2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3.

2.2. *Construction documents* shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16.

2.3. For breakaway walls designed to have a resistance of more than 20 psf (0.96 kN/m^2) determined using allowable stress design, *construction documents* shall include a statement that the breakaway wall is designed in accordance with ASCE 24.

Revise as follows:

G103.7 Alterations in coastal areas. Prior to issuing a permit for any alteration of sand dunes and mangrove stands in flood hazard areas subject to high velocity wave action <u>and coastal A zones</u>, the *building official* shall require submission of an engineering analysis which demonstrates that the proposed alteration will not increase the potential for flood damage.

G301.2 Subdivision requirements. The following requirements shall apply in the case of any proposed subdivision, including proposals for manufactured home parks and subdivisions, any portion of which lies within a flood hazard area:

1. The flood hazard area, including floodways<u>,</u> ~~and~~ areas subject to high velocity wave action<u>, and coastal A zones</u>, as appropriate, shall be delineated on tentative and final subdivision plats;
2. Design flood elevations shall be shown on tentative and final subdivision plats;
3. Residential building lots shall be provided with adequate buildable area outside the floodway; and
4. The design criteria for utilities and facilities set forth in this appendix and appropriate *International Codes* shall be met.

G401.2 Flood hazard areas subject to high-velocity wave action <u>and coastal A zones</u>. In *flood hazard areas* subject to high-velocity wave action <u>and coastal A zones</u>:

1. New buildings and buildings that are substantially improved shall only be authorized landward of the reach of mean high tide.
2. The use of fill for structural support of buildings is prohibited.

[B] 309.3 Flood hazard areas subject to high-velocity wave action <u>and coastal A zones</u>. Structures located in flood hazard areas subject to high-velocity wave action <u>and coastal A zones</u> shall meet the requirements of Section 309.2. The plumbing systems, pipes and fixtures shall not be mounted on or penetrate through walls intended to break away under flood loads.

[B] 301.16.1 High-velocity wave action <u>and coastal A zones</u>. In flood hazard areas subject to high-velocity wave action <u>and coastal A zones</u>, mechanical systems and *equipment* shall not be mounted on or penetrate walls intended to break away under flood loads.

Reason: The IBC achieves compliance with the NFIP in Sec. 1612, by reference to ASCE 24 for the specific design and construction requirements. This proposal is to insert the term "coastal A zone" wherever the term "flood hazard area subject to high velocity wave action" appears, to be consistent with ASCE 24. Because of the way the term is defined, only if the Limit of Moderate Wave Action is delineated (or otherwise designated by the AHJ), is the area to be regulated as coastal A zone. ASCE 24-05 has provisions that apply in all Coastal High Hazard Areas (Zone V) and coastal A zones, essentially treating them the same (there are some slight differences because coastal A zones are shown as "Zone A" on Flood Insurance Rate Maps). When 1612.4 refers the user to ASCE 24, one of the first determinations is which flood hazard zone affects the building site. Currently, ASCE 24-05 requires the designer to determine whether conditions landward of Zone V meet the characteristics necessary for coastal A zone conditions. The proposed definition is consistent with the next edition of ASCE 24 that will specify that only if the Limit of Moderate Wave Action (LiMWA) is delineated on the FIRM (or otherwise designated by the AHJ) will the requirements for CAZ apply. FEMA uses the LiMWA to delineate the inland extend of CAZ.

A separate proposal was submitted to change the term "flood hazard area subject to high velocity wave action" to be "coastal high hazard area," which is the term used in the IRC and ASCE 24.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: Costs will be lower because the RDP and the building official will not have to made independent determinations as to whether a site landward of a Zone V does or does not have coastal A zone conditions. For areas that are subject to coastal A zone conditions there is no change in construction costs because ASCE 24 already has specifications based on whether a building site is or is not subject to coastal A zone conditions.

S102-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1403.7-S-INGARGIOLA-WILSON.doc

S103–12

202, 1403.7, 1603.1.7, 1612.3, 1612.5, 1804.4, G103.7, G301.2, G401.2, G601.1; IPC P309.3, IMC M301.16.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS IS A THREE PART CODE CHANGE. ALL THREE PARTS WILL BE HEARD BY THE STRUCTURAL COMMITTEE AS THREE SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

PART I – IBC STRUCTURAL

Revise as follows:

SECTION 202
DEFINITIONS

~~FLOOD HAZARD AREA SUBJECT TO HIGHVELOCITY WAVE ACTION~~ COASTAL HIGH HAZARD AREA. Area within the special *flood hazard area* extending from offshore to the inland limit of a primary dune along an open coast and any other area that is subject to high-velocity wave action from storms or seismic sources, and shown on a Flood Insurance Rate Map (FIRM) or other flood hazard map as velocity zones Zone V, VO, VE or V1-30.

Revise as follows:

1403.7 Flood resistance for ~~high-velocity wave action areas~~ coastal high hazard areas. For buildings in ~~flood hazard areas subject to high-velocity wave action~~ coastal high hazard area as established in Section 1612.3, electrical, mechanical and plumbing system components shall not be mounted on or penetrate through exterior walls that are designed to break away under flood loads.

Revise as follows:

1603.1.7 Flood design data. For buildings located in whole or in part in *flood hazard areas* as established in Section 1612.3, the documentation pertaining to design, if required in Section 1612.5, shall be included and the following information, referenced to the datum on the community's Flood Insurance Rate Map (FIRM), shall be shown, regardless of whether flood loads govern the design of the building:

1. In *flood hazard areas* ~~not subject to high-velocity wave action~~ other than coastal high hazard areas, the elevation of the proposed lowest floor, including the basement.
2. In *flood hazard areas* ~~not subject to high-velocity wave action~~ other than coastal high hazard areas, the elevation to which any nonresidential building will be dry flood proofed.
3. In ~~*flood hazard areas* subject to high-velocity wave action~~ coastal high hazard areas, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including the basement.

1612.4 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including ~~flood hazard areas subject to high-velocity wave action~~ coastal high hazard areas, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.

1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*:

1. For construction in *flood hazard areas* ~~not subject to high-velocity wave action~~ other than coastal high hazard areas:
   1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3.
   1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1 of ASCE 24, *construction documents* shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24.
   1.3. For dry floodproofed nonresidential buildings, *construction documents* shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.
2. For construction in ~~flood hazard areas subject to high-velocity wave action~~ coastal high hazard areas:
   2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3.
   2.2. *Construction documents* shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16.
   2.3. For breakaway walls designed to have a resistance of more than 20 psf (0.96 kN/m2) determined using allowable stress design, *construction documents* shall include a statement that the breakaway wall is designed in accordance with ASCE 24.

Revise as follows:

1804.4 Grading and fill in flood hazard areas. In *flood hazard areas* established in Section 1612.3, grading and/or fill shall not be *approved*:

1. Unless such fill is placed, compacted and sloped to minimize shifting, slumping and erosion during the rise and fall of flood water and, as applicable, wave action.
2. In floodways, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a *registered design professional* in accordance with standard engineering practice that the proposed grading or fill, or both, will not result in any increase in flood levels during the occurrence of the *design flood*.
3. In ~~flood hazard areas subject to high-velocity wave action~~ coastal high hazard areas, unless such fill is conducted and/or placed to avoid diversion of water and waves toward any building or structure.
4. Where design flood elevations are specified but floodways have not been designated, unless it has been demonstrated that the cumulative effect of the proposed *flood hazard area* encroachment, when combined with all other existing and anticipated *flood hazard area* encroachment, will not increase the design flood elevation more than 1 foot (305 mm) at any point.

Revise as follows:

G103.7 Alterations in coastal areas. Prior to issuing a permit for any alteration of sand dunes and mangrove stands in ~~flood hazard areas subject to high velocity wave action~~ coastal high hazard areas, the *building official* shall require submission of an engineering analysis which demonstrates that the proposed alteration will not increase the potential for flood damage.

G301.2 Subdivision requirements. The following requirements shall apply in the case of any proposed subdivision, including proposals for manufactured home parks and subdivisions, any portion of which lies within a flood hazard area:

1. The flood hazard area, including floodways ~~and areas subject to high velocity wave action~~ coastal high hazard areas, as appropriate, shall be delineated on tentative and final subdivision plats;
2. Design flood elevations shall be shown on tentative and final subdivision plats;
3. Residential building lots shall be provided with adequate buildable area outside the floodway; and
4. The design criteria for utilities and facilities set forth in this appendix and appropriate *International Codes* shall be met.

G401.2 ~~Flood hazard areas subject to high-velocity wave action~~ Coastal high hazard areas. In ~~*flood hazard areas* subject to high-velocity wave action~~ coastal high hazard areas:

1. New buildings and buildings that are substantially improved shall only be authorized landward of the reach of mean high tide.
2. The use of fill for structural support of buildings is prohibited.

G601.1 Placement prohibited. The placement of recreational vehicles shall not be authorized in ~~*flood hazard areas* subject to high velocity wave action~~ coast high hazard areas and in *floodways*.

PART II – IPC

Revise as follows:

[B] P309.3 ~~Flood hazard areas subject to high-velocity wave action~~ Coastal high hazard areas. Structures located in ~~flood hazard areas subject to high-velocity wave action~~ coastal high hazard areas shall meet the requirements of Section 309.2. The plumbing systems, pipes and fixtures shall not be mounted on or penetrate through walls intended to break away under flood loads.

PART III – IMC

Revise as follows:

[B] 301.16.1 ~~High-velocity wave action~~ Coastal high hazard areas. In ~~flood hazard areas subject to high-velocity wave action~~ coastal high hazard areas, mechanical systems and *equipment* shall not be mounted on or penetrate walls intended to break away under flood loads.

Reason: This proposal is to simply replace one term with another and edit the definition to be consistent with how the term is defined in ASCE 24. The term "Flood Hazard Area Subject to High-Velocity Wave Action" is descriptive of the flood hazard areas designated Zone V on Flood Insurance Rate Maps. However, the term is not used by the NFIP, nor is it used in the IRC or in ASCE 24, which is referenced by the IBC (1612.4). The NFIP regulations define "coastal high hazard area" at 40 CFR 59.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S103-12
PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL PLUMBING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – INTERNTIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-COASTAL HIGH HAZARD AREA-S-INGARGIOLA-WILSON.doc

S104–12
202

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, pregory.p.wilson@dhs.gov), Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

DRY FLOODPROOFING. A combination of design modifications that results in a building or structure, including the attendant ~~utility~~ utilities and equipment and sanitary facilities, being water tight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist *loads* as identified in ASCE 7.

Reason: This editorial change is proposed for consistency with term as used in the next edition of ASCE 24. The current edition, ASCE 25-05, uses both the term "attendant utilities and equipment" (preferred) and the term "utilities and attendant equipment." All uses of the latter will be revised for consistency.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction.

S104-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-S-DRY FLOODPROOFING-INGARGIOLA-WILSON-QUINN.doc

S105– 12
1612.4, 1612.4.1 (NEW), 1612.4.2 (NEW),

Proponent: Stephen V. Skalko, P.E,, Portland Cement Association, Eric T. Stafford, P.E., representing Institute for Business and Home Safety and Jason Thompson, P.E., National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

1612.4 Design and construction. The design and construction of buildings and structures located in *flood hazard areas*, including flood hazard areas subject to high-velocity wave action, shall be in accordance with Chapter 5 of ASCE 7, ASCE 24, Sections 1612.4.1 and 1612.4.2 as applicable.

<u>**1612.4.1 Floor elevation.** Floors required by ASCE 24 to be built above the base flood elevations shall have the floor and their lowest horizontal supporting members not less the higher of the following:</u>

1. <u>design flood elevation,</u>
2. <u>base flood elevation plus 3 feet, or</u>
3. <u>advisory base flood elevation plus 3 feet, or</u>
4. <u>the 500-year flood, if known.</u>

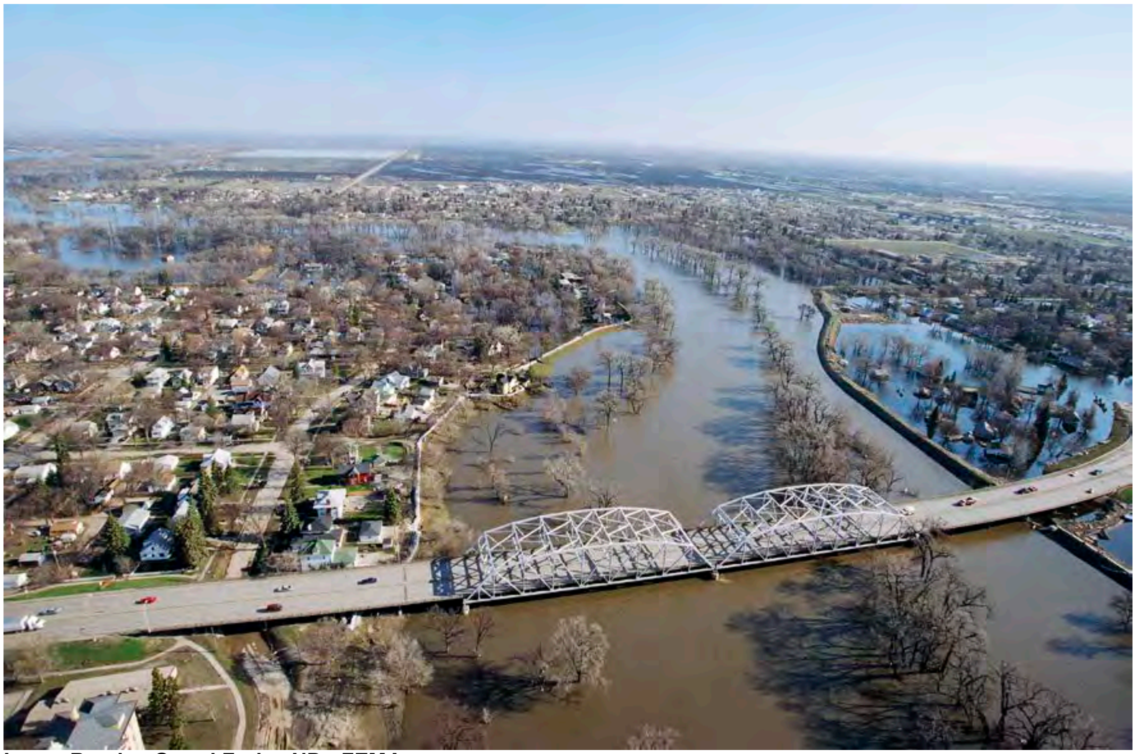
<u>**1612.4.2 Flood protective works.** Buildings designed and constructed in accordance with ASCE 24 shall not consider levees and floodwalls for providing flood protection during the design flood.</u>

Reason: Buildings constructed in accordance with the Section 1612 of the International Building Code are considered to meet minimum requirements. However recent flood hazard events have demonstrated that the requirements in the present code are not sufficient. This proposal strengthens the requirements in the code for establishing the habitable floor elevation with a reasonable safety factor.

First, the elevation of lowest floor level above the base flood elevation is increased from the level normally considered acceptable to meet minimum requirements of the IBC. Many local jurisdictions already modify the IBC with provisions of two, three, or even more feet above the base flood elevation as the required minimum elevation of floors for occupiable space.

Secondly, levees and floodwalls should not be considered as flood protection for structures during a design flood. This is consistent with the primary directive of ASCE 24, *Flood Resistant Design and Construction,* referenced in Section 1612 of the IBC. In recent times there has been an increase in the amount of individual property damage, loss of life and destruction of whole neighborhoods when areas at risk to flooding along river basins are inundated by water after protective works failed or were overtopped or breeched. Examples of levees that failed to protect properties are shown in the attached photographs.

17th Street Levee – New Orleans – USACE



Levee Break – Grand Forks, ND - FEMA

Flood damage - FEMA

Cost Impact: The code change proposal will increase the cost of construction.

S105-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

S106–12
1612.5

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov) (gregory.p.wilson@dhs.gov), Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*:

1. For construction in *flood hazard areas* not subject to high-velocity wave action:
   1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3 <u>and for the final inspection in Section 110.3.10.1</u>.
   1.2 For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1 of ASCE 24, *construction documents* shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24.
   1.3. For dry floodproofed nonresidential buildings, *construction documents* shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.
2. For construction in flood hazard areas subject to high velocity wave action:
   2.1 The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3 <u>and for the final inspection in Section 110.3.10.1</u>.
   2.2. *Construction documents* shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16.
   2.3. For breakaway walls designed to have a resistance of more than 20 psf (0.96 kN/m2) determined using allowable stress design, *construction documents* shall include a statement that the breakaway wall is designed in accordance with ASCE 24.

Reason: This proposal achieves consistency with Section 110. The 2012 IBC includes a requirement, added in the last code change cycle, that surveyed building elevations be submitted to the building official prior to the final inspection (approved by ADM14-09/10).

Cost Impact: The code change proposal will not increase the cost of construction.

S106-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1612.5-S-INGARGIOLA-WILSON-QUINN.doc

S107–12
1613.1

Proponent: James Bela, Oregon Earthquake Awareness, representing self

Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions ~~in accordance with ASCE 7,~~ excluding Chapter 14 and Appendix 11A. The *seismic design category* for a structure ~~is permitted to~~ shall be determined in accordance with Section 1613 ~~or ASCE 7~~.

Exceptions:

1. Detached one- and two-family dwellings, assigned to *Seismic Design Category* A, B or C, or located where the mapped short-period spectral response acceleration, *SS*, is less than 0.4 g.
2. The seismic force-resisting system of wood-frame buildings that conform to the provisions of Section
   2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.

Reason: (1) ASCE 7 adopted the NEHRP Provisions (developed at the public's expense) as its "standard, then proceeded to charge the engineering community (and the public) for its "commandeering" of those Provisions as its standard.

(a) NEHRP Provisions previously have been adopted into model building codes, as in the Southern Building Code, with no problems (and, particularly, with no "added expense."
ASCE 7 carries a "disclaimer" for its use.

(2) ASCE 7 contains no "references" to justify its legitimacy.
(3) ASCE 7 was the instigator of so-called:) RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE$_R$) (~~MCE~~) GROUND MOTION RESPONSE ACCELERATIONS FOR 0.2- and 1SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B.

(a) this is based on fatally flawed "applied mathematics" assumed in probabilistic seismic hazard assessment, or psha: see discussions under Code Change: FIGURES 1613.3.1 (1)(2)(3)(4)(5)(6)

(4) ASCE 7 is "codifying everything," and is becoming a de-facto code. Code provisions need to remain in a public consensus arena; their "disclaimer" perhaps absolves them from the problems they are creating – but they are creating "unintended consequences" for professional practice.
(5) ASCE 7 is full of errata, which casts substantial questions about the quality of effort and rigor that is going into its formulation.

Cost Impact: The code change proposal will decrease the cost of construction.

S107-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1613.1-S-BELA.doc

S108–12
1613.1

Proponent: Jeff Sprout, AIA, Target Corporation (jeff.sprout@target.com)

Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapter 14 and Appendix 11A. The *seismic deign category* for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Exception:

1. Detached one- and two-family dwellings, assigned to *Seismic Design Category* A, B or C, or located where the mapped short-period special response acceleration, Ss, is less than 0.4g.
2. The seismic force-resisting system of wood-frame building that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.
5. <u>Anchorage of fixtures, cases, shelves, counters and partitions not over 8’-0” in height when designed to resist overturning.</u>

Reason: To provide further clarification that ties back into Section105.2 Work exempt from permit, item #13: “Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753mm) in height”. It has been shown in shake table tests and in the recent Japan earthquake, where unanchored fixtures under 8’ tall, that did resist overturning, kept the aisle ways reasonably clear, allowing for safe exiting.

Cost Impact: The code change proposal will not increase the cost of construction.

S108-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

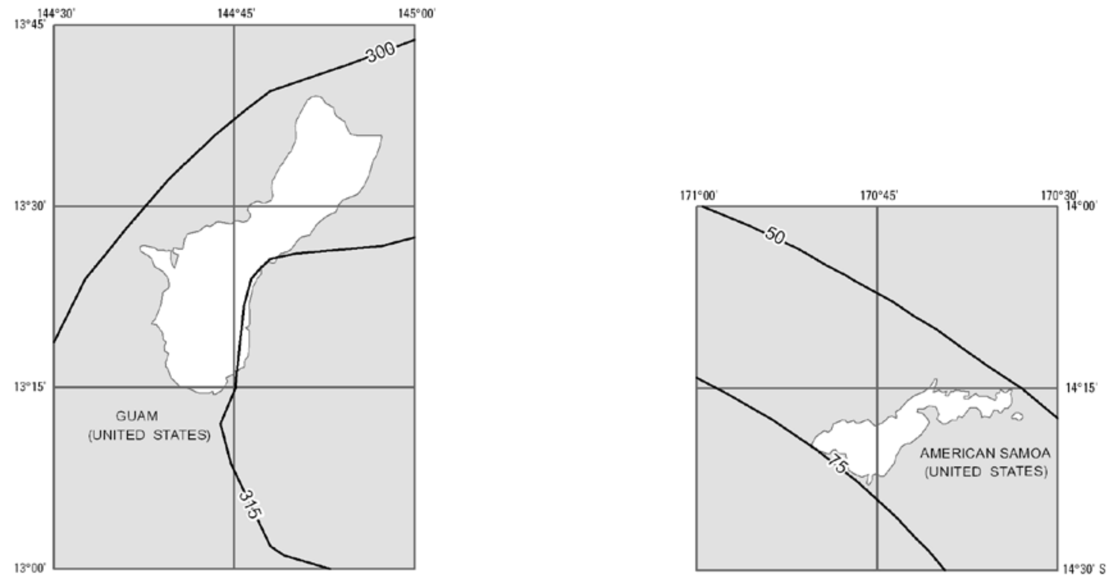
1613.1-S-SPROUT.doc

S109–12
1613.3.1

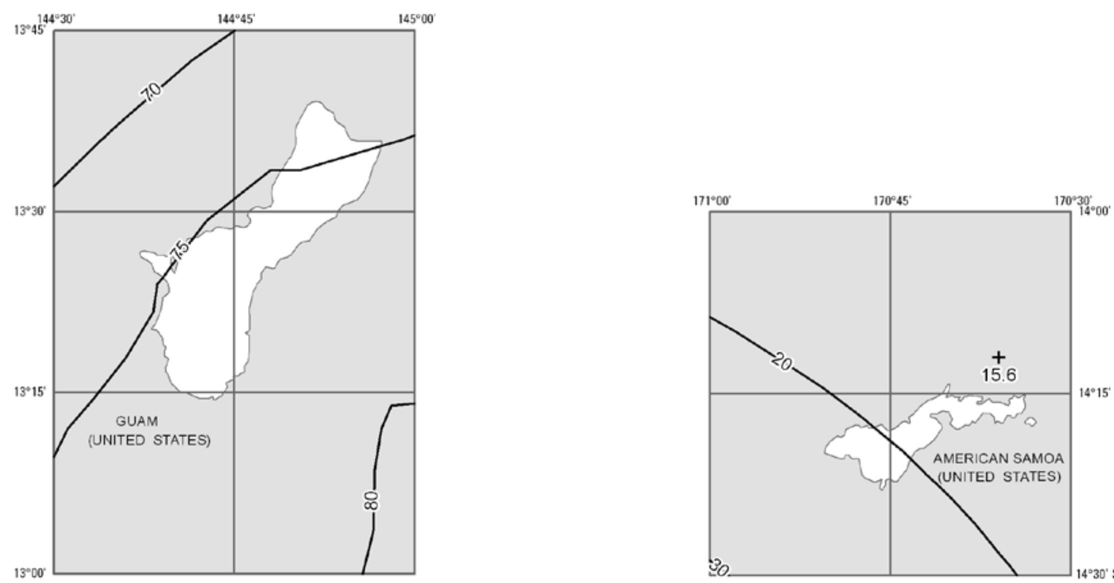
Proponent: Nicolas Luco, US Geological Survey (USGS), representing National Earthquake Hazards Reduction Program (nluco@usgs.gov), Michael Mahoney, Federal Emergency Management Agency (FEMA), representing National Earthquake Hazards Reduction Program

Revise as follows:

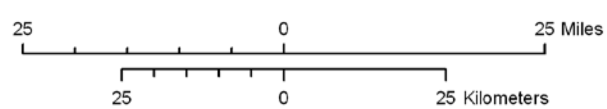
1613.3.1 Mapped acceleration parameters. The parameters S_S and S_1 shall be determined from the 0.2 and 1-second spectral response accelerations shown on Figures 1613.3.1(1) through 1613.3.1(~~6~~<u>7</u>) Where S_1 is less than or equal to 0.04 and S_S is less than or equal to 0.15, the structure is permitted to be assigned *Seismic Design Category* A.~~ The parameters Ss and S1 shall be, respectively, 1.5 and 0.6 for Guam and 1.0 and 0.4 for American Samoa.~~



0.2-Second Spectral Response Acceleration (5% of Critical Damping)



1.0-Second Spectral Response Acceleration (5% of Critical Damping)



Risk-Targeted Maximum Considered Earthquake (MCE_R) Ground Motion Response Accelerations for Guam and American Samoa of 0.2-Second Spectral Response Acceleration (5% of Critical Damping), Site Class B

<u>FIGURE 1613.3.1(7) RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE_R) GROUND MOTION RESPONSE ACCELERATIONS FOR GUAM AND AMERICAN SAMOA OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B</u>

Reason: The US Geological Survey (USGS) has the responsibility under the National Earthquake Hazards Reduction Program to develop and maintain seismic hazard maps that are the basis of the Risk-Targeted Maximum Considered Earthquake (MCE_R) Ground Motion maps in the nation's model building codes. As part of that responsibility, the USGS recently developed seismic hazard and MCE_R ground motion maps for Guam and American Samoa, using the same methodology as for the conterminous US, Hawaii, Alaska, and Puerto Rico and the US Virgin Islands. The MCE_R ground motion maps developed are being proposed as an addition to the existing maps in Figure 1613.3.1.

Cost Impact: The code change proposal will increase or decrease the cost of construction, depending on the geographic location.

S109-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1613.3.1-S-LUCO-MAHONEY.doc

S110–12

Figures 1613.3.1(1) (NEW), 1613.3.1(2) (NEW), 1613.3.1(3) (NEW), 1613.3.1(4) (NEW), 1613.3.1(5) (NEW), 1613.3.1(6) (NEW)

Proponent: James Bela, Oregon Earthquake Awareness, representing self

Delete and substitute as follows:

~~FIGURE 1613.3.1(1)~~
~~RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCER) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B~~

~~FIGURE 1613.3.1(2)~~
~~RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCER) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B~~

~~FIGURE 1613.3.1(3)~~
~~RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCER) GROUND MOTION RESPONSE ACCELERATIONS FOR HAWAII OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B~~

~~FIGURE 1613.3.1(4)~~
~~RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCER) GROUND MOTION RESPONSE ACCELERATIONS FOR ALASKA OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS~~

~~FIGURE 1613.3.1(5)~~
~~RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCER) GROUND MOTION RESPONSE ACCELERATIONS FOR ALASKA OF 1.0-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B~~

~~FIGURE 1613.3.1(6)~~
~~RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCER) GROUND MOTION RESPONSE ACCELERATIONS FOR PUERTO RICO AND THE UNITED STATES VIRGIN ISLANDS OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5%OF CRITICAL DAMPING), SITE CLASS B~~

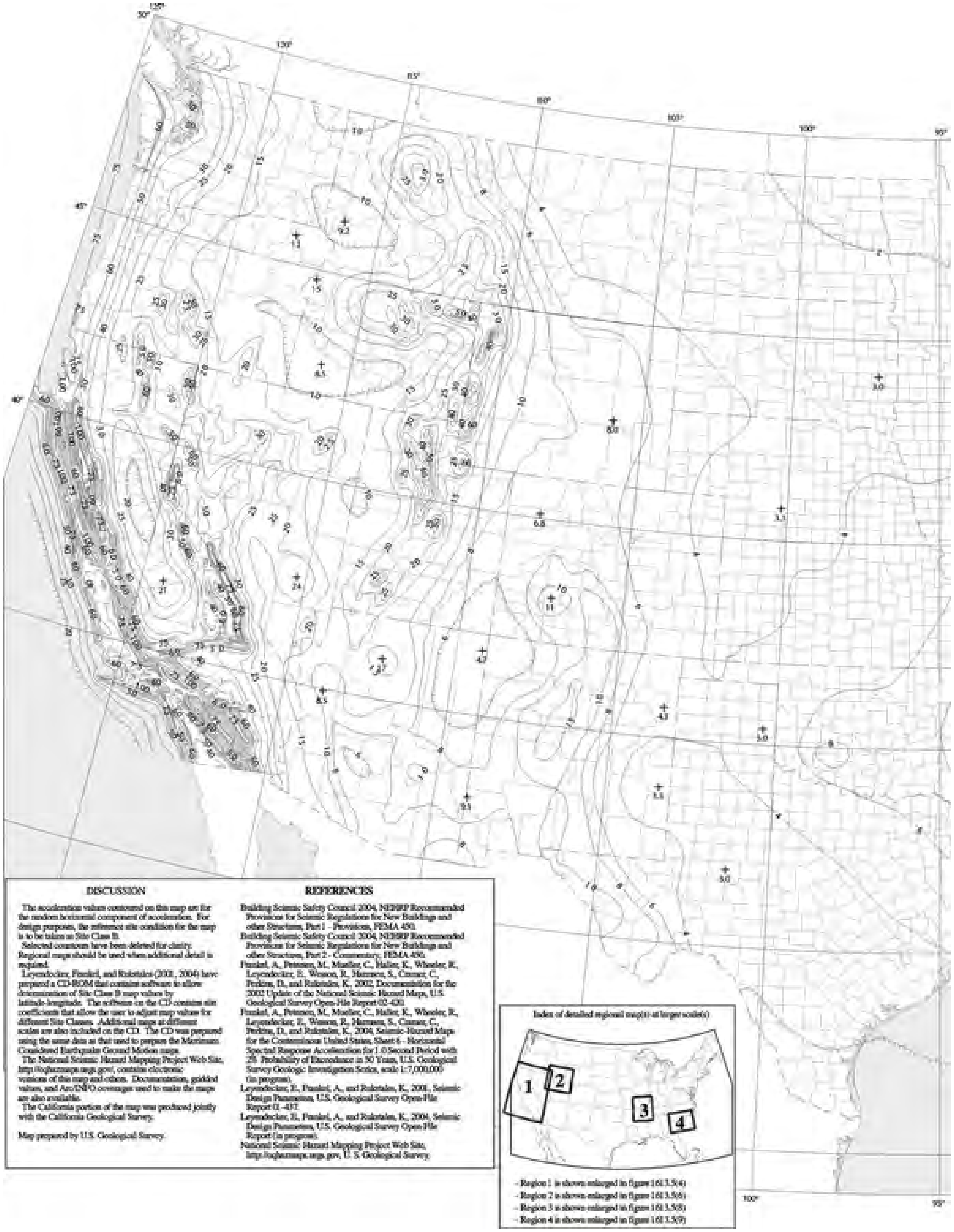


FIGURE 1613.3.1(1)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

FIGURE 1613.3.1(1) - continued
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

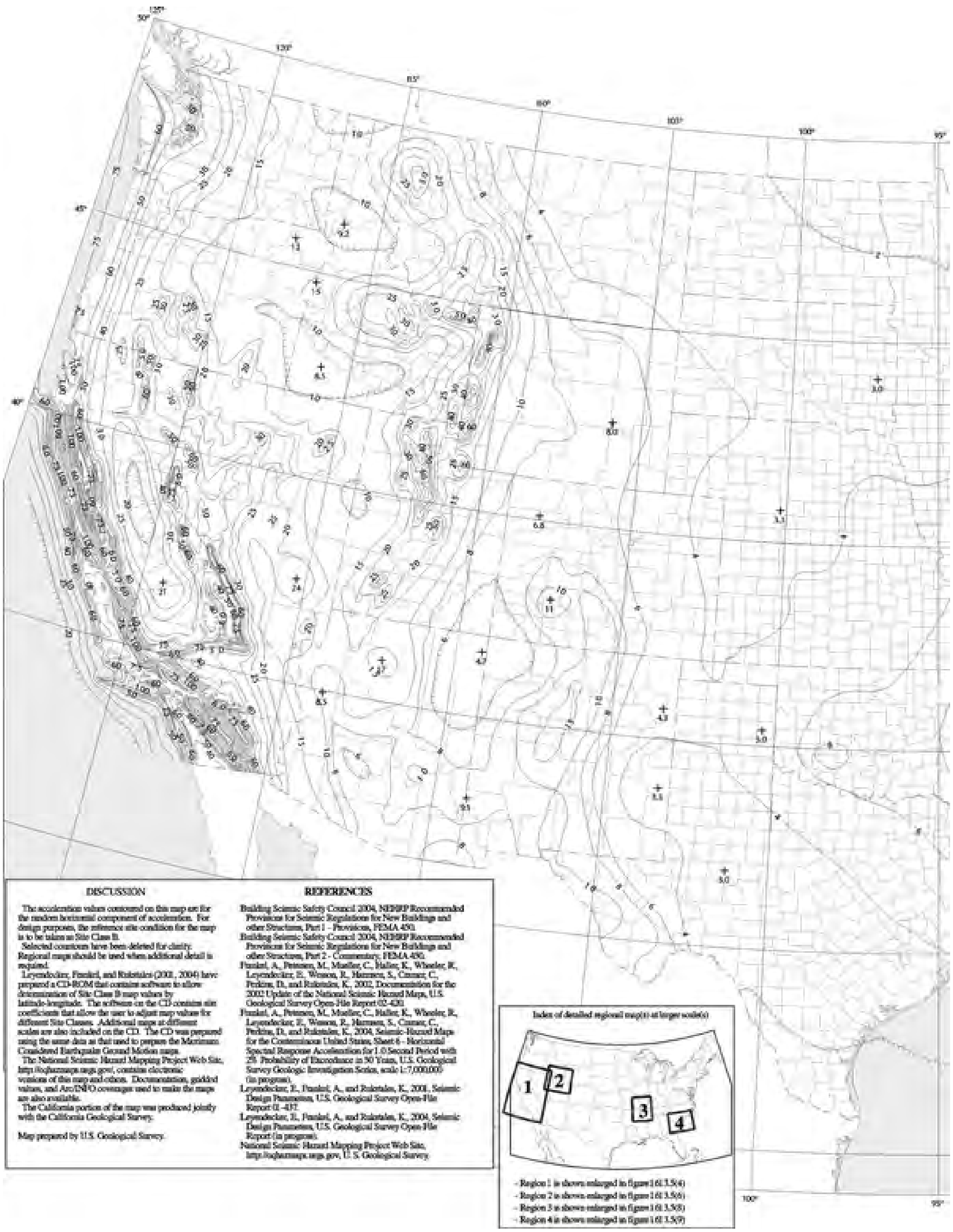


FIGURE 1613.3.1(2)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

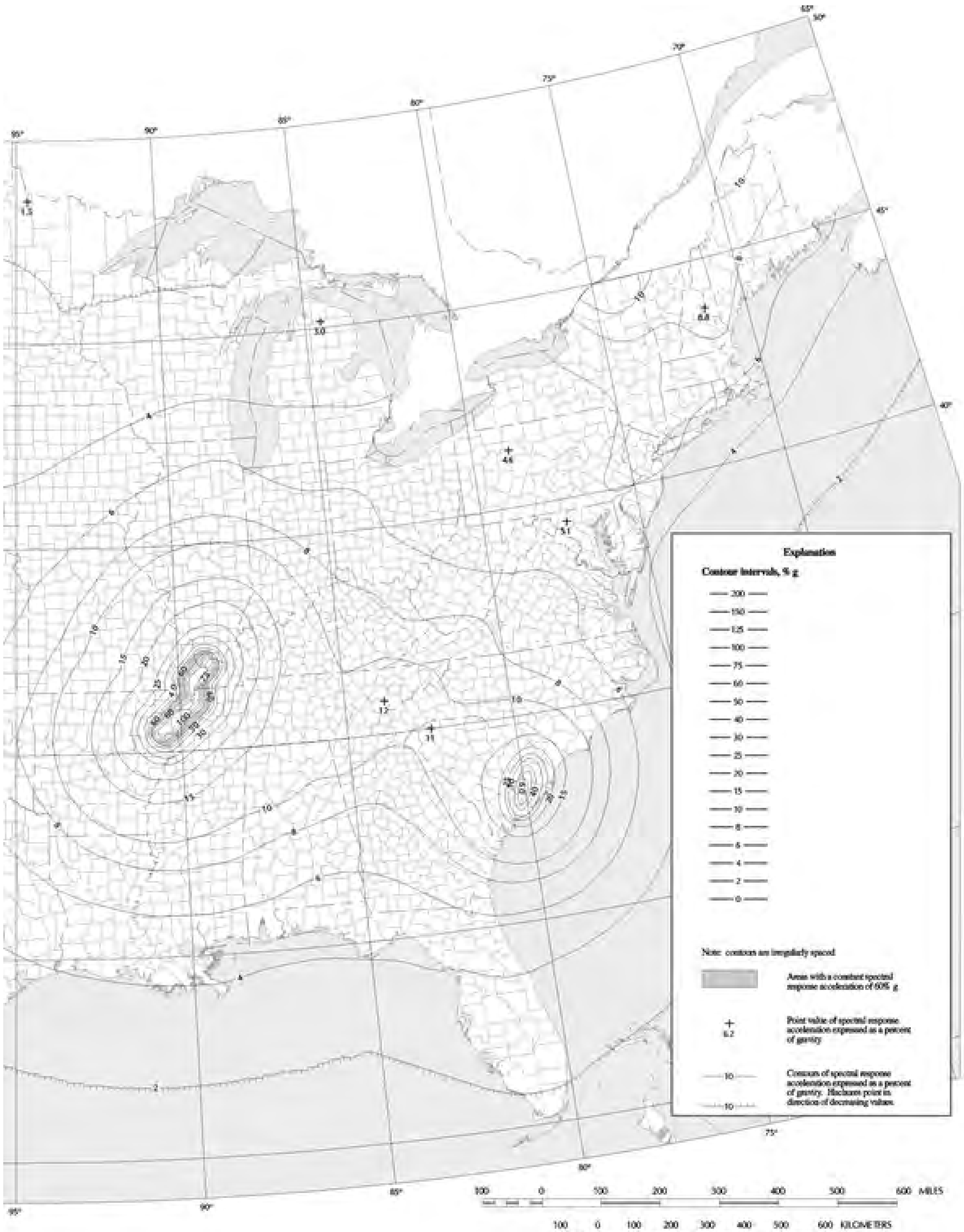
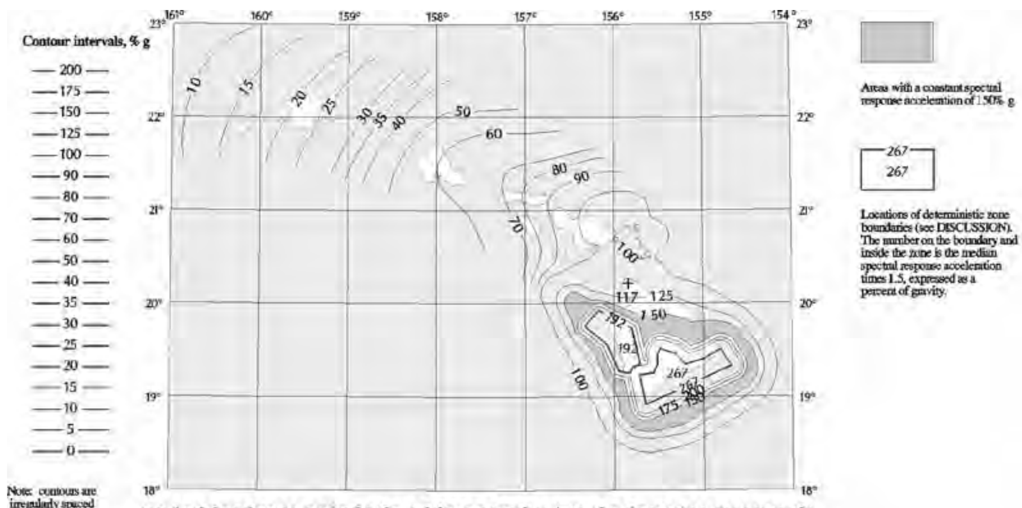
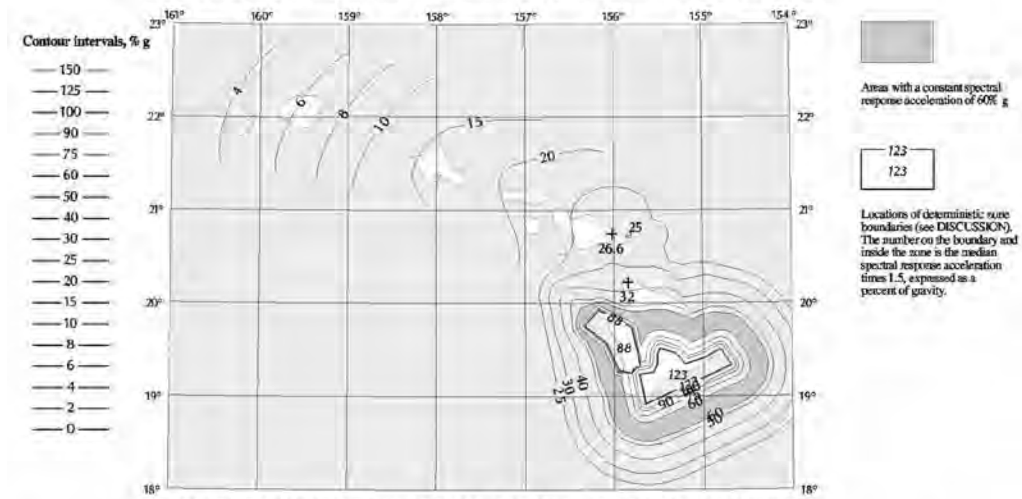


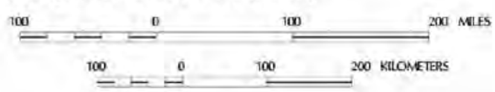
FIGURE 1613.3.1(2) - continued
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B



0.2 SEC SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING)



1.0 SEC SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING)



Explanation

+ 6.2	Point value of spectral response acceleration expressed as a percent of gravity
10 / 10	Contours of spectral response acceleration expressed as a percent of gravity. Hachures point in direction of decreasing values.

DISCUSSION

The acceleration values contoured on this map are for the random horizontal component of acceleration. For design purposes, the reference site condition for the map is to be taken as Site Class B.

The two areas shown as zone boundaries are the projection to the earth's surface of horizontal rupture planes at 9 km depth. Spectral accelerations are constant within the boundaries of the zones. The number on the boundary and inside the zone is the median spectral response acceleration times 1.5.

Leyendecker, Frankel, and Rukstales (2001, 2004) have prepared a CD-ROM that contains software to allow determination of Site Class B map values by latitude-longitude. The software on the CD contains site coefficients that allow the user to adjust map values for different Site Classes. Additional maps at different scales are also included on the CD. The CD was prepared using the same data as that used to prepare the Maximum Considered Earthquake Ground Motion maps.

The National Seismic Hazard Mapping Project Web Site, http://eqhazmaps.usgs.gov, contains electronic versions of this map and others. Documentation, gridded values, and Arc/INFO coverages used to make the maps are also available.

Map prepared by U.S. Geological Survey.

REFERENCES

Building Seismic Safety Council 2004, NEHRP Recommended Provisions for Seismic Regulations for New Buildings and other Structures, Part 1 - Provisions, FEMA 450.
Building Seismic Safety Council 2004, NEHRP Recommended Provisions for Seismic Regulations for New Buildings and other Structures, Part 2 - Commentary, FEMA 450.
Klein, F., Frankel, A., Mueller, C., Wesson, R. and Okubo, P., 2001, Seismic hazard in Hawaii: high rate of large earthquakes and probabilistic ground-motion maps, Bull. Seism. Soc. Am., v. 91, pp. 479-498.
Klein, F., Frankel, A., Mueller, C., Wesson, R. and Okubo, P., 1998, Seismic-Hazard Maps for Hawaii, Sheet 2 - 2% Probability of Exceedance in 50 Years for Peak Horizontal Acceleration and Horizontal Spectral Response Acceleration for 0.2, 0.3, and 1.0 Second Periods U.S. Geological Survey Geologic Investigation Series I-2724, scale 1:2,000,000.
Leyendecker, E., Frankel, A., and Rukstales, K., 2001, Seismic Design Parameters, U.S. Geological Survey Open-File Report 01-437.
Leyendecker, E., Frankel, A., and Rukstales, K., 2004, Seismic Design Parameters, U.S. Geological Survey Open-File Report (in progress).
National Seismic Hazard Mapping Project Web Site, http://eqhazmaps.usgs.gov, U. S. Geological Survey.

FIGURE 1613.3.1(3)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR HAWAII OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

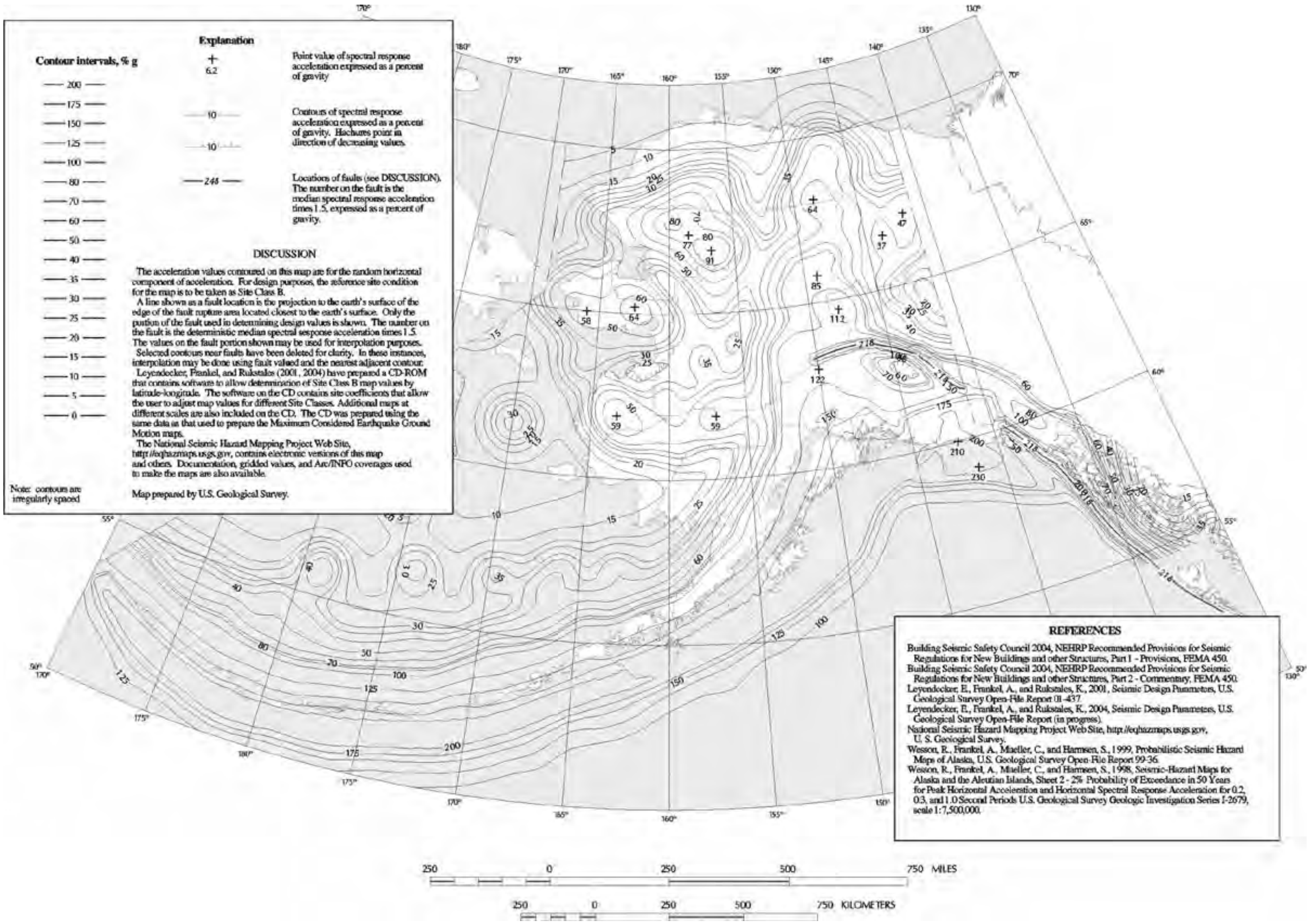


FIGURE 1613.3.1(4)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR ALASKA OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

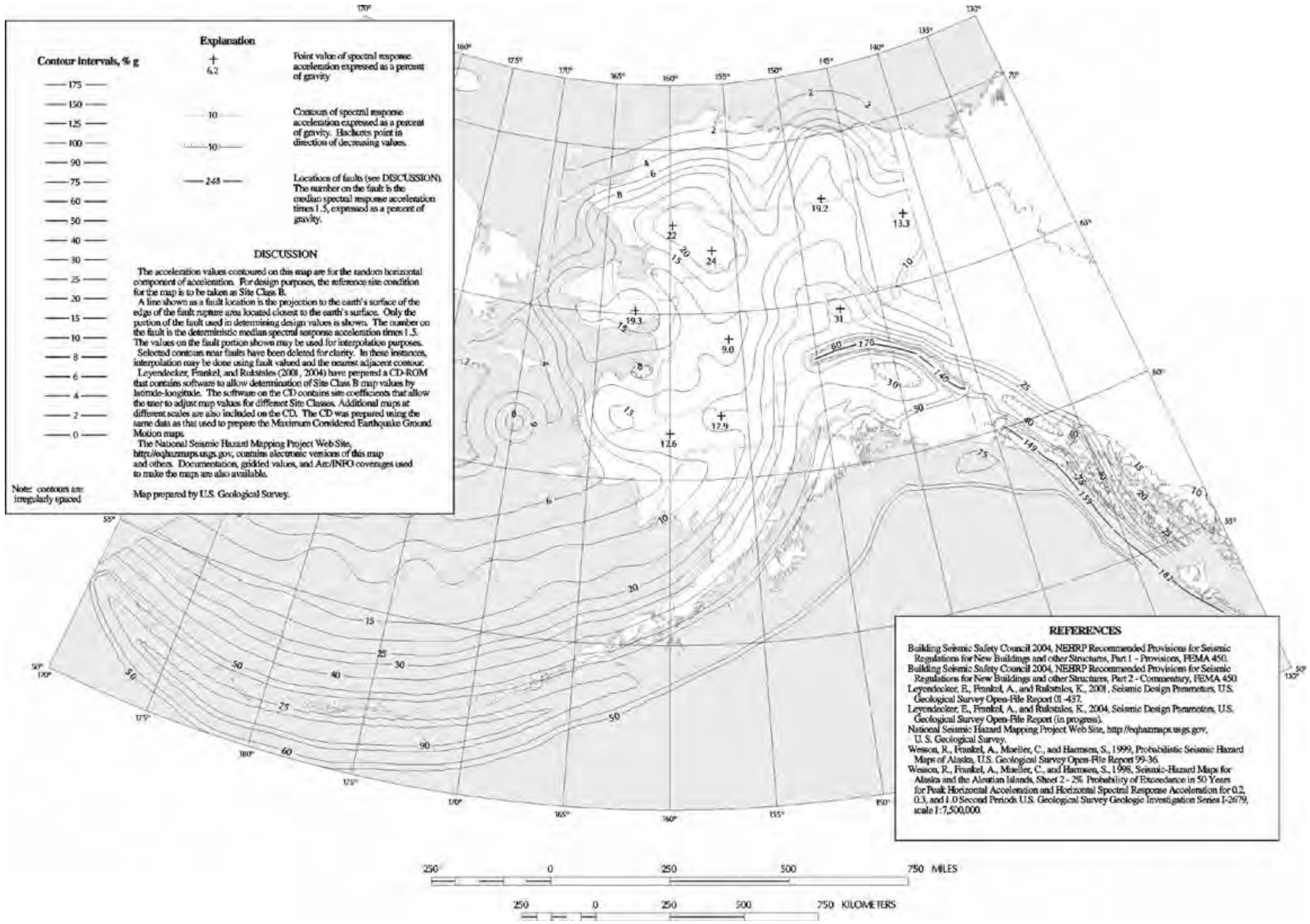
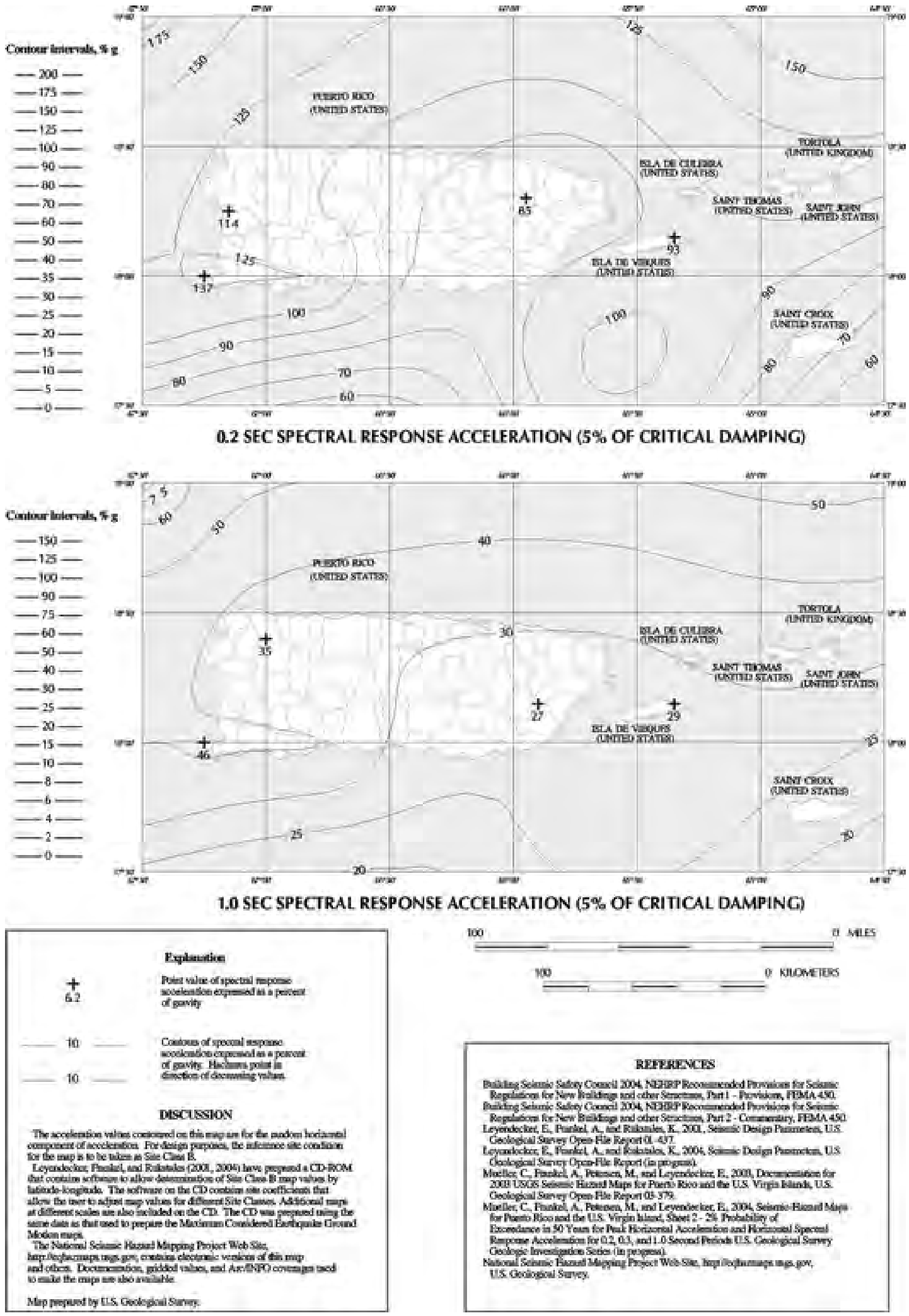


FIGURE 1613.3.1(5)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR ALASKA OF 1.0-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B



<u>**FIGURE 1613.3.1(6)**</u>
<u>**MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION RESPONSE ACCELERATIONS FOR PUERTO RICO AND THE UNITED STATES VIRGIN ISLANDS OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B**</u>

Reason: (1) Constantly changing the USGS National Seismic Hazard Maps' "ground motion response accelerations contours" is **destabilizing** to design practice, plan review requirements, and code enforcement provisions, because such changes are:

(a) creating **yo-yo earthquake design standards** – "high" one code cycle and "low" the next; or vice-versa; making it, as a result,

ever more difficult to develop, practice and apply "professional engineering judgment" in the design process.
(b) creating serious and perplexing problems for addressing seismic hazards for **existing buildings** – which must then **"benchmark"** to a specific year and to a specific version (year & edition) of seismic hazard map (for any specific public policy mandate/requirements for earthquake retrofit/mitigation ordinances or measures. These required "benchmark" seismic hazard maps will then be different (sometimes a lot different) from the current (and ever-changing and ever-evolving) USGS National Seismic Hazard Maps. This is, and will continue to be, a big source of confusion.

(2) RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE_R) GROUND MOTION RESPONSE ACCELERATIONS contours in the IBC 2012 / ASCE 7-10 are sometimes **30% lower** than previous map values of just a decade ago:

(a) the recent 08-23-2011 M 5.8 Mineral VA (Cuckoo) earthquake had 30% lower design values (with these new maps) than a decade ago – making the earthquake's epicentral region **Seismic Design Category A-B**; yet the **actual intensity of earthquake ground shaking** experienced there was the "stated intensity" that could be expected for the IBC/ASCE 7-10 designation **SDC D!**.(Bela 2011)
(b) when the seismic hazard maps **depict such low hazard ground motion response accelerations** and their corresponding **low** Seismic Design Categories, they both foster and create the "circumstances" for **"comfortable inaction;"** and, unfortunately, this feeling of "comfortable inaction" easily transfers to the arena of public policy.
(c) The condition of "comfortable inaction" (due to perceived low hazard - depicted on the seismic hazard map) was cited as perhaps the main culprit in Christ Church, New Zealand's lack of adequate preparedness during its recent hammering by a "pair" of earthquakes – which killed around 200 people in unsafe **"Killer Buildings."**.
(3) The basic underlying methodology for preparing the USGS National Seismic Hazard Maps (and their derivative so-called Risk-Targeted Maximum Considered Earthquake (MCE_R) Ground Motion Response Accelerations contours); i.e., probabilistic seismic hazard assessment (or psha) is fatally **"flawed"** – due to systemic "errors" in the applied mathematics which both create and define it. And it is, unfortunately, these same flawed "mathematics" that are prescribing how these psha-determined ground motion contours are ultimately derived, computed . . . and then finally codified.
(4) Errors in its methodology aside, the basic problems, difficulties and really insurmountable obstacles to performing a psha seismic hazard assessment *(Mualchin, 2010; Bela and Mualchin 2011)* have **never** actually been "solved." And they still remain unsolved! These problems involve data-driven earth-science requirements for a knowledge and understanding of:

(a) fault slip rates;
(b) frequency of occurrence of earthquakes (and their known magnitudes); and
(c) earthquake source mechanisms – specifically, (i) the style of faulting: and (ii) the hypocentral depth (or where exactly the earthquake rupture process begins).

(5) The psha methodology is easily "manipulated," particularly in the sense that: (i) selecting the probabilistic hazard level is a totally **arbitrary** process; and (ii) changing the hazard level (higher hazard or lower hazard) gives a completely different ground motion response acceleration contour – and consequently, then, different code requirements!
(6) These very real and insurmountable problems with psha's methodology have been swept away by its proponents: by convoluted (and mostly unintelligible) efforts and preoccupations with "logic trees," "quantifying uncertainties," etc. These efforts proceed busily ahead; but, meanwhile, they are "neglecting baseline principles" (of "what" the earthquake can do to you – and "how" it can do it – and the maximum Magnitude it could be). All that mathematical busywork, logic-tree accounting, and so-called "expert opinion" built a the "better model" (or -- so the proponents believe). Unfortunately, that "better model" then:

(a) has become **"substituted"** for "reality" by its creators;
(b) has dismissed criticisms of it -- by claiming (itself) to be "best available science;" and
(c) has become ultimately so **"complicated" --** that not even its proponents now can logically and successfully explain how it came to be (Hamburger et. al., 2010; Bela, 2011); nor can they effectively explain how to apply it to the real world of earthquake engineering, public safety, and socioeconomic issues of community resiliency.

(7) The ground motion accelerations, and their probabilities for exceeding them, are combined and co-mingled in such a way that the actual sources (or **earthquake magnitudes**, **frequency content of earthquake ground motions**, and **duration** of strong ground shaking) are treated more-or-less equally—and they are most certainly not!
(8) The **"Maximum Credible Earthquake" (MCE)** or "Maximum Capable Earthquake" or "Maximum Possible Earthquake" (within ¼ unit of Magnitude, M) is never explicitly stated. And it's really "Magnitude, Magnitude, Magnitude!" (and for the same reasons previously stated in (4)) – that has everything to do with building performance (damage and repair costs) and, more importantly, public safety and community resilience.
(9) R-Factors, or Response Modification Factors, that are used in design become **less reliable** in ascertaining/predicting the **"end result"** (or the building's actual performance in an earthquake). And, **"an earthquake"** really needs to explicitly consider the full suite of earthquake possibilities that the regional tectonics forewarn us can occur (including MCE = Maximum Credible Earthquake, or Maximum Possible Earthquake). "R-Factors" have become less reliable primarily because:
(a) quite a lot of the "ductility" or building "toughness" that the code relies upon to: (i) ride out the earthquake (by bending, not breaking, and absorbing energy); and (ii) remain standing (without killing the occupants) -- is due to "over-strength;" and.
(b) when the code design "strength" is systematically diminished (weakened) or reduced (over several-to-many iterations of seismic hazard mapping --by lowering (yo-yo effect) the "numerator" quantity in the design strength

equation; then when dividing this numerator (now smaller number) by the same "large" number (R-Factor in denominator) – we have now "lost" perhaps a good portion of our "over-strength" – that was implicit in selecting the weights of the various R-Factors in the first place!

Basically, with RISK-TARGETED (MCE_R) , the code is now dividing an ever-decreasing and now smaller number (perhaps by 30%) by the same "large" number (R-Factor denominator) -- with the result that the buildings' performances and outcomes are really now much less certain . . . and also now much more problematical.

(10) The psha methodology has been shown in dramatic and tragic fashion to be not only "misleading", but also deadly, in the last decade or so of the **"Eleven of the World's Deadliest Earthquakes." (Panza et. al. 2011, Table 1)** In example after example, and all across the globe (where now more than 700, 000 people have perished); the psha-methodology "prescribed" seismic hazard: was determined to be either low or very low – but was "disproved" in these many cases by earthquakes that were "surprises" from what psha had determined could be expected. In too many of these deadly "surprises", the actual intensities of ground shaking experienced were greater by factors of 2X to 4X – than what psha had predicted. (Bela 2010; Bela and Mualchin, 2011;

Kossobokov and Nekrasova, 2010;)

It is clear that this is an unsafe situation (to general public) that must **not** continue; but it does continue for some of these following main reasons:

(a) the psha methodology is "anonymous," so when there is clear evidence (> 700,000 casualties) that it is "not working;" no one is accountable for its: (i) external failures (mass casualties); and/or (ii) internal failures (very real errors in its "applied mathematics" derivations).
(b) the psha methodology has a hierarchial and powerful elite behind its influence and continued use.
(c) the psha methodology has a pedigree of high sounding terms (like "quantifying uncertainty," "logic-tree", "expert opinion," "best science," etc.) -- all purporting to increase the method's **"precision."** But the end result, as these Eleven Deadliest Earthquakes" have shown us, is, unfortunately, still too **"inaccurate"** and "too deadly" for protecting the public safety. And in this regard, it is clearly missing its target!

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Kossobokov, V.G. and A.K. Nekrasova (2010). Global Seismic Hazard Program Maps are Misleading, Abstract U 13A – 0020 Poster presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
http://www.agu.org/meetings/fm10/fm10-sessions/fm10_U13A.html

Mualchin, L. (2010) History of Modern Earthquake Hazard Mapping and Assessment in California Using a Deterministic or Scenario Approach, Pure and Applied Geophysics Volume 168, Numbers 3-4, 383-407, DOI: 10.1007/s00024-010-0121-1
[From the issue entitled "Special Issue: Advanced Seismic Hazard Assessment. Part II: Regional Seismic Hazard and Seismic Microzonation Case Studies"]
http://www.springerlink.com/content/p301955r53nk5xl2/

Panza, G.F.; Irikura, K.; Kouteva-Guentcheva, M.; Peresan, A.; Wang, Z.; Saragoni, R. (Eds.) (2011). Advanced Seismic Hazard Assessment, 320 p.
http://www.springer.com/earth+sciences+and+geography/book/978-3-0348-0091-4

Table 1 List of the top eleven deadliest earthquakes occurred during the period 2000-2011 and the corresponding intensity differences (ΔI) among the observed values and those predicted by the Global Seismic Hazard Assessment Program, or GSHAP.

Allesandro Martelli, Paolo Clemente, Massimo Forni, Giuliano F. Panza,
Antonello Salvatori (2011).

RECENT DEVELOPMENT AND APPLICATION OF SEISMIC ISOLATION AND ENERGY DISSIPATION SYSTEMS, IN PARTICULAR IN ITALY, CONDITIONS FOR THEIR CORRECT USE AND RECOMMENTATIONS FOR CODE IMPROVEMENTS, in 12TH WORLD CONFERENCE ON SEISMIC ISOLATION, ENERGY DISSIPATION AND ACTIVE CONTROL OF STRUCTURES Sept. 20-23, 2011 Sochi-city, Russia

Cost Impact: The code change proposal will not increase the cost of construction.

S110-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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S111–12
1613.5 (NEW), 1613.5.1 (NEW)

Proponent: Kelly Cobeen, representing self; Dana Deke Smith and Steve Winkel, Building Seismic Safety Council, representing FEMA/Code Resource Support Committee (dsmith@nibs.org) (swinkel@preview-group.com)

Add new text as follows:

1613.5 Amendments to ASCE 7. The provisions of Section 1613.5 shall be permitted as an amendment to the relevant provisions of ASCE 7.

1613.5.1 Transfer of anchorage forces into diaphragm. Modify ASCE 7 Section 12.11.2.2.1 as follows:

12.11.2.2.1 Transfer of anchorage forces into diaphragm. Diaphragms shall be provided with continuous ties or struts between diaphragm chords to distribute these anchorages forces into the diaphragms. Diaphragm connections shall be positive, mechanical, or welded. Added chords are permitted to be used to form subdiaphragms to transmit the anchorage forces to the main continuous cross-ties. The maximum length-to-width ratio of a wood, wood structural panel, or untopped steel deck sheathed structural subdiaphragm that serves as part of the continuous tie system shall be 2.5 to 1. Connections and anchorages capable of resisting the prescribed forces shall be provided between the diaphragm and the attached components. Connections shall extend into the diaphragm a sufficient distance to develop the force transferred into the diaphragm.

Reason: The subdiaphragm aspect ratio is indicated in this proposal as only applying to wood sheathed diaphragms, wood structural panel sheathed diaphragms, and untopped metal deck diaphragm. When limitation of subdiaphragms was first submitted as a proposed change to the 1997 UBC by Kariotis [code change proposal 1631.2.8-95-1 K.A.S.E.] in the form of an allowable shear limitation, the reason focused on tilt-up buildings with nailed diaphragms and contemporary designs not meeting the intent of provisions written after observed poor performance in the 1973 Sylmar Earthquake. When approved for inclusion in the 1997 UBC [code change proposal 16-96-2 SEAOC/ Seismology] the approved wording for the aspect ratio limitation specifically applied only to wood structural subdiaphragms. In the process of being included in the IBC and ASCE 7, the wording designating wood subdiaphragms was dropped, making the requirement applicable to all subdiaphragms. This code change proposes to reintroduce the limit to wood subdiaphragms because they are the original system of concerns and observed poor performance, and include untopped steel deck diaphragms due to the similarities in construction and perceived structural behavior. This aspect ratio limit is not perceived to be necessary for good performance for other diaphragm types; once this aspect ratio limit is removed for concrete, composite deck, and other diaphragm types, other diaphragm limitations within the referenced material standards will govern design.

Cost Impact: The code change proposal will not increase the cost of construction and may reduce cost for some structural systems.

S111-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1613.5.1-S-COBEEN-SMITH-WINKEL.doc

S112–12
1701.3

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Delete without substitution:

~~**1701.3 Used materials.** The use of second-hand materials that meet the minimum requirements of this code for new materials shall be permitted.~~

Reason: This is nearly identical to 104.9.1 and is thus redundant here.

Cost Impact: The code change proposal will not increase the cost of construction.

S112-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1701.3-S-KERR.doc

S113–12

1703.1.3, 1703.5.2, 1703.6, 1703.6.2, 1704.1, 1704.2, 1704.2.1, 1704.2.2, 1704.2.4, 1704.3, 1704.3.1, 1704.3.2, 1705.1, 1705.1.1, Table 1705.2.2, 1705.3, Table 1705.3, 1705.3.1, 1705.4, 1705.4.1, 1705.4.2, 1705.6, Table 1705.6, 1705.7, Table 1705.7, 1705.8, Table 1705.8, 1705.9, 1705.11.1, 1705.13, 1705.13.1, 1705.13.2, 1705.14, 1901.4, [F] 909.18.8, [F] 909.18.8.1, [F] 909.21.7[F] 1705.17, [F] 1705.17.1

Proponent: Phillip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IFC COMMITTEE, AS TWO SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC STRUCTURAL

Revise as follows:

1703.1.3 Personnel. An *approved agency* shall employ experienced personnel educated in conducting, supervising and evaluating tests and/or *special* inspections.

1703.5.2 Inspection and identification. The *approved agency* shall periodically perform ~~an~~ a *special* inspection, which shall be in-plant if necessary, of the product or material that is to be *labeled*. The ~~inspection~~ *special inspector* shall verify that the labeled product or material is representative of the product or material tested.

1703.6 Evaluation and follow-up inspection services. Where structural components or other items regulated by this code are not visible for *special* inspection after completion of a prefabricated assembly, the applicant shall submit a report of each prefabricated assembly. The report shall indicate the complete details of the assembly, including a description of the assembly and its components, the basis upon which the assembly is being evaluated, test results and similar information and other data as necessary for the *building official* to determine conformance to this code. Such a report shall be *approved* by the *building official*.

1703.6.2 Test and inspection records. Copies of necessary test and *special* inspection records shall be filed with the *building official*.

SECTION 1704
SPECIAL INSPECTIONS AND TESTS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATIONS

1704.1 General. This section provides minimum requirements for special inspections and tests, the statement of special inspections, contractor responsibility and structural observations.

1704.2 Special inspections and tests. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform *special* inspections and tests during construction on the types of work listed under Section 1705. These *special* inspections and tests are in addition to the inspections by the building official that are identified in Section 110.

Exceptions:

1. *Special inspections* and tests are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.

2. Unless otherwise required by the *building official*, *special inspections* and tests are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
3. *Special inspections* and tests are not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.

1704.2.1 Special inspector qualifications. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant ~~when~~ where the documented experience or training is related in complexity to the same type of *special inspection* or testing activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspectors for the work designed by them, provided they qualify as special inspectors.

1704.2.2 Access for special inspection. The construction or work for which special inspection or testing is required shall remain accessible and exposed for special inspection or testing purposes until completion of the required special inspections or tests.

1704.2.4 Report requirement. Special inspectors shall keep records of *special* inspections and tests . The special inspector shall ~~furnish~~ submit reports of *special* inspections ~~reports~~ and tests to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected or tested was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* or tests, and correction of any discrepancies noted in the inspections or tests, shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the *building official*.

1704.3 Statement of special inspections. Where *special inspections* or ~~testing is~~ tests are required by Section 1705, the *registered design professional in responsible charge* shall prepare a statement of special inspections in accordance with Section 1704.3.1 for submittal by the applicant in accordance with Section 1704.2.3.

Exception: The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

1704.3.1 Content of statement of special inspections. The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have *special inspections* or ~~testing~~ tests by the *building official* or by the *registered design professional* responsible for each portion of the work.
2. The type and extent of each *special inspection*.
3. The type and extent of each test.
4. Additional requirements for *special inspections* or ~~testing~~ tests for seismic or wind resistance as specified in Sections 1705.10, 1705.11 and 1705.12.
5. For each type of *special inspection*, identification as to whether it will be continuous *special inspection* or periodic *special inspection*.

1704.3.2 Seismic requirements in the statement of special inspections. Where Section 1705.11 or 1705.12 specifies special inspection, testing or qualification for seismic resistance, the statement of special inspections shall identify the designated seismic systems and seismic force-resisting systems that are subject to the *special inspections* or tests

SECTION 1705
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS AND TESTS

1705.1 General. ~~Verification and~~ *Special* inspections and tests of elements of buildings and structures shall ~~be as required by~~ meet the applicable requirements of this section.

1705.1.1 Special cases. *Special inspections* and tests shall be required for proposed work that is, in the opinion of the *building official*, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that are alternatives to materials and systems prescribed by this code.
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

TABLE 1705.2.2
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

~~VERIFICATION AND INSPECTION~~ TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Special inspection of welding:			
a. Cold–formed steel deck			
1. Floor and roof deck welds	—	X	AWS D1.3
b. Reinforcing steel:			
1. Verification of weldability of reinforcing steel other than ASTM A706	—	X	
2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—	AWS D1.4 ACI 318: Section 3.5.2
3. Shear reinforcement.	X	—	
4. Other reinforcing steel	—	X	

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.

1705.3 Concrete construction. ~~The~~ S*pecial inspections* and ~~verifications for~~ tests of concrete construction shall be as ~~required~~ by performed in accordance with this section and Table 1705.3.

Exception: *Special inspections* and tests shall not be required for:

(Portions of section not shown remain unchanged)

TABLE 1705.3
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

~~VERIFICATION AND INSPECTION~~ TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE

(Portions of table not shown remain unchanged)

1705.3.1 Materials~~s~~ tests. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 3.5.2 of ACI 318.

1705.4 Masonry construction. *Special inspections* and tests of masonry construction shall be ~~inspected and verified~~ in accordance with the quality assurance program requirements of TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6 ~~quality assurance program requirements~~.

Exception: *Special inspections* and tests shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, where they are part of a structure~~s~~ classified as *Risk Category* I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance.

1705.4.1 Empirically designed masonry, glass unit masonry and masonry veneer in Risk Category IV. ~~The minimum *special inspection* program~~ *Special inspections* and tests for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, ~~in~~ where they are part of a structure~~s~~ classified as *Risk Category* IV, in accordance with Section 1604.5, shall ~~comply~~ be performed in accordance with TMS 402/ACI 530/ASCE 5, Level B Quality Assurance.

1705.4.2 Vertical masonry foundation elements. *Special inspections* and tests of vertical masonry foundation elements shall be performed in accordance with Section 1705.4 ~~for vertical masonry foundation elements~~.

1705.6 Soils. *Special inspections* ~~for~~ and tests of existing site soil conditions, fill placement and load-bearing requirements shall be ~~as required by~~ performed in accordance with this section and Table 1705.6. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance. During fill placement, the special inspector shall ~~determine~~ verify that proper materials and procedures are used in accordance with the provisions of the *approved* geotechnical report.

Exception: Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.

TABLE 1705.6
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS AND TESTS OF SOILS

~~VERIFICATION AND INSPECTION TASK~~ TYPE	CONTINUOUS ~~DURING TASK LISTED~~ SPECIAL INSPECTION	~~PERIODICALLY DURING TASK LISTED SPECIAL INSPECTION~~ PERIODIC

(Portions of table not shown remain unchanged)

1705.7 Driven deep foundations. *Special inspections* and tests shall be performed during installation ~~and testing~~ of driven deep foundation elements as ~~required by~~ specified in Table 1705.7. The *approved instruction documents* prepared by the *registered design professionals*, shall be used to determine compliance.

TABLE 1705.7
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATION ELEMENTS

~~VERIFICATION AND INSEPCTION TASK~~ TYPE	CONTINUOUS ~~DURING TASK LISTED~~ SPECIAL INSPECTION	~~PERIODICALLY DURING TASK LISTED~~ PERIODIC SPECIAL INSPECTION
5. For steel elements, perform additional special inspections in accordance with Section 1705.2.	–	-
6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3.	–	-

(Portions of table not shown remain unchanged)

1705.8 Cast-in-place deep foundations. *Special inspections* and tests shall be performed during installation ~~and testing~~ of cast-in place deep foundation elements as ~~required by~~ specified in Table 1705.8. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals*, shall be used to determine compliance.

TABLE 1705.8
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

~~VERIFICATION AND INSPECTION TASK~~ TYPE	CONTINUOUS ~~DURING TASK LISTED~~ SPECIAL INSPECTION	~~PERIODICALLY DURING TASK LISTED~~ SPECIAL INSPECTION
3. For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3.	—	—

1705.9 Helical pile foundations. Continuous *special inspections* shall be performed ~~continuously~~ during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the *registered design professional in responsible charge*. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professional* shall be used to determine compliance.

1705.11.1 Structural steel. *Special inspection* ~~for~~ of structural steel shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** *Special inspections* of structural steel in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.13 Sprayed fire-resistant materials. *Special inspections* ~~for~~ and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.13.1 through 1705.13.6. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* and tests shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.

1705.13.1 Physical and visual tests. The *special inspections* and tests shall include the ~~following tests and observations~~ to demonstrate compliance with the listing and the fire-resistance rating:

1. Condition of substrates.

2. Thickness of application.
3. Density in pounds per cubic foot (kg/m^3).
4. Bond strength adhesion/cohesion.
5. Condition of finished application.

1705.13.2 Structural member surface conditions. The surfaces shall be prepared in accordance with the *approved* fire-resistance design and the written instructions of *approved* manufacturers. The prepared surface of structural members to be sprayed shall be inspected by the *special inspector* before the application of the sprayed fire-resistant material.

1705.14 Mastic and intumescent fire-resistant coatings. *Special inspections* and tests for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be performed in accordance with AWCI 12-B. *Special inspections* and tests shall be based on the fire-resistance design as designated in the *approved construction documents*.

Revise as follows:

1901.4 Special inspections and tests. ~~The~~ *Special inspections* and tests of concrete elements of buildings and structures and concreting operations shall be as required by Chapter 17.

PART II - IFC

Revise as follows:

[F] 909.18.8 ~~Special inspections~~ Testing for smoke control. Smoke control systems shall be tested by a special inspector.

[F] 909.18.8.1 Scope of testing. ~~*Special inspections*~~ Testing shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

909.21.7 ~~Special inspection~~ Testing. ~~*Special inspection*~~ Testing for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

[F] 1705.17 ~~Special inspection~~ Testing for smoke control. Smoke control systems shall be tested by a special inspector.

Reason: The proposal has several purposes. It distinguishes between inspections by the building official and special inspections by special inspectors by adding "special" after "inspection" where special inspections by special inspectors are intended. It adds "tests" after "special inspections" to recognize that the requirements of Chapter 17 distinguish between (1) special inspections by the special inspector, and (2) tests by the special inspector or other individuals employed or retained by the approved agency at the construction site or testing facilities. It deletes references to "verification," which is considered superfluous given that a primary purpose for inspection, including special inspection, is to verify that the construction complies with the building code and the approved construction documents. It also changes the charging language in several places to state that special inspections and tests shall be "performed" rather than be "as required by" for consistency with the charging language elsewhere in Chapter 17.

The titles of Tables 1705.3, 1705.6, 1705.7 and 1705.8 are revised to specify tests as well as special inspections due to the tests that are specified in the first column of each table. The columns labeled "continuous" and "periodic" are changed to "continuous special inspection" and "periodic special inspection" because these distinctions apply to special inspections but not to tests. These changes are not made to Table 1705.2.2 because there are no tests specified in the table.

In Section 1705.4.1, "where they are part of" a structure is added for consistency with similar language in Section 1705.4, Exception, Item #1. In Section 1705.17, the title is changed from "special inspection" to "testing" because there are requirements for testing in the section but there are none for special inspection.

An additional benefit of the proposal is that replacement of Table 1705.4 in the 2009 IBC with a reference to TMS 402/ACI 530/ASCE 5 in the 2012 IBC effectively eliminated requirements for special inspection by continuing the use of "inspected." The changes above clarify the intended requirements for special inspection.

Changes to Sections 1705.2 through 1705.2.2 were included in early drafts of this proposal but they were deleted after the changes were incorporated into separate proposals, which was the result of collaboration with the steel industry.

Note that separate proposals:

1. Further modify Section 1704.2 by changing the title from “special inspections” to “approved agency”
2. Further modify Section 1704.3.2 by deleting “qualification”
3. Change “inspection” to “inspections” in Sections 1705.10.1, Exception; 1705.10.2, Exception; 1705.11.2, Exception; and 1705.11.3, Exception
4. Further modify Section 1704.3.1 by deleting Item #1 and
5. Change “inspection” to “inspections” in Sections 1705.2.2 and 1705.2.2.1.2 .

Cost Impact: The code change proposal will not increase the cost of construction.

S113-12

PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL FIRE CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1703.1.3-S-BRAZIL.doc

S114–12
1703.1, 1703.1.1, 1703.3

Proponent: Phillip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1703.1 Approved agency. An *approved agency* shall provide all information as necessary for the *building official* to determine that the agency meets the applicable requirements specified in Sections 1703.1.1 through 1703.1.4.

1703.1.1 Independence. An *approved agency* shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose to the *building official* and the *registered design professional in responsible charge* possible conflicts of interest so that objectivity can be confirmed.

1703.3 ~~Approved~~ Record of approval. For any material, appliance, equipment, system or method of construction that has been *approved*, a record of such approval, including the conditions and limitations of the approval, shall be kept on file in the *building official's* office and shall be ~~open to~~ available for public ~~inspection~~ review at appropriate times.

Reason: Section 1703.1 requires approved agencies to provide the information necessary for the building official to verify that the agency meets the applicable requirements but these requirements are not identified. The proposal specifies the sections containing the requirements.

Section 1703.1.1 requires approved agencies to disclose possible conflicts of interest so that objectivity can be confirmed but the recipient of the disclosure is not identified. The proposal specifies the building official and the registered design professional in responsible charge as the recipients.

Section 1703.3 is clarifies the requirement of the building official to provide access to the public for records of approval.

Cost Impact: The code change proposal will not increase the cost of construction.

S114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1703.1-S-BRAZIL.doc

S115–12

104.11.3 (NEW), 104.11.4 (NEW), 104.12 (NEW), 104.12.1 (NEW), 104.12.2 (NEW), 104.12.3 (NEW), 104.12.4 (NEW), 1703.2, 1703.3, 1703.4, 1703.4.1, 1703.4.2, 1703.5, 1703.5.1, 1703.5.2, 1703.5.3, 1703.5.4

Proponent: D. Kirk Harman,The Harman Group representing, The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee.

Add new text as follows:

104.11.3 Written approval. Any material, design, equipment, or method of construction that has been shown to meet the requirements of this code shall be *approved* in writing after satisfactory completion of the required tests and submission of required test reports.

104.11.4 Approved record. For any material, design, equipment, or method of construction that has been *approved*, a record of such approval, including the conditions and limitations of the approval, shall be kept on file in the *building official's* office and shall be open to public inspection at appropriate times.

104.12 Labeling. Where materials or assemblies are required by this code to be *labeled*, such materials and assemblies shall be *labeled* by an *approved agency* in accordance with Section 1703. Products and materials required to be labeled shall be labeled in accordance with the procedures set forth in Sections 104.11.5.1 through 104.11.5.4.

104.12.1 Testing. An *approved agency* shall test a representative sample of the product or material being *labeled* to the relevant standard or standards. The *approved agency* shall maintain a record of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard.

104.12.2 Inspection and identification. The *approved agency* shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be *labeled*. The inspection shall verify that the labeled product or material is representative of the product or material tested.

104.12.3 Label information. The *label* shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or material's performance characteristics and *approved agency's* identification.

104.12.4 Method of labeling. Information required to be permanently identified on the product shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.

Delete without substitution:

~~**1703.2 Written approval.** Any material, appliance, equipment, system or method of construction meeting the requirements of this code shall be *approved* in writing after satisfactory completion of the required tests and submission of required test reports.~~

~~**1703.3 Approved record.** For any material, appliance, equipment, system or method of construction that has been *approved*, a record of such approval, including the conditions and limitations of the approval, shall be kept on file in the *building official's* office and shall be open to public inspection at appropriate times.~~

~~**1703.4 Performance.** Specific information consisting of test reports conducted by an *approved* testing agency in accordance with the appropriate referenced standards, or other such information as necessary, shall be provided for the *building official* to determine that the material meets the applicable code requirements.~~

~~**1703.4.1 Research and investigation.** Sufficient technical data shall be submitted to the *building official* to substantiate the proposed use of any material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the *building official* shall approve the use of the material or assembly subject to the requirements of this code. The costs, reports and investigations required under these provisions shall be paid by the applicant.~~

~~**1703.4.2 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.~~

~~**1703.5 Labeling.** Where materials or assemblies are required by this code to be *labeled*, such materials and assemblies shall be *labeled* by an *approved agency* in accordance with Section 1703. Products and materials required to be labeled shall be labeled in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.4.~~

~~**1703.5.1 Testing.** An *approved agency* shall test a representative sample of the product or material being *labeled* to the relevant standard or standards. The *approved agency* shall maintain a record of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard.~~

~~**1703.5.2 Inspection and identification.** The *approved agency* shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be *labeled*. The inspection shall verify that the labeled product or material is representative of the product or material tested.~~

~~**1703.5.3 Label information.** The *label* shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or material's performance characteristics and *approved agency's* identification.~~

~~**1703.5.4 Method of labeling.** Information required to be permanently identified on the product shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.~~

Reason: Chapter 17 is titled "Special Inspections and Tests" and as such, should be reserved for the special inspection and testing associated with construction projects.

This proposal moves paragraphs from **SECTION 1703 APPROVALS** to **Section 104.11 Alternate materials, design and methods of construction and equipment**, which is under **SECTION 104 DUTIES AND POWERS OF THE BUILDING OFFICIAL**, as these paragraphs deal with the approval of materials and systems not covered by the Code. The language of new Sections 104.11.3, and 104.11.4 has been modified slightly to align with Section 104.11, and old sections 1703.4, 1703.4.1 and 1703.4.2 have been deleted without being moved to Section 104.11, as existing sections 104.11.1 and 104.11.2 already cover research reports and the testing associated with approval of materials and systems not covered by the Code.

Paragraphs dealing with products that require labeling have been moved to a new Section 104.12, without modification. Existing Sections 1703.6, 1703.6.1, and 1703.6.2 have been deleted without being moved to Chapter 1 as the requirements for fabricated assemblies are already covered in Section 1704.2.5, 1704.2.5.1, and 1704.2.5.2.

Cost Impact: The code change proposal will not increase the cost of construction.

S115-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1703.2-S-HARMAN.doc

S116–12

1703.4, 1703.4.1, 1703.4.2, 1703.5, 1703.5.1, 1703.5.2, 1703.5.3, 1703.5.4

Proponent: Phillip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1703.4 Performance. Specific information consisting of test reports conducted by an *approved* testing agency in accordance with the appropriate referenced standards, or other such information as necessary, shall be provided for the *building official* to determine that the product, material or assembly meets the applicable code requirements.

1703.4.1 Research and investigation. Sufficient technical data shall be submitted to the *building official* to substantiate the proposed use of any product, material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the *building official* shall approve the use of the product material or assembly subject to the requirements of this code. The costs, reports and investigations required under these provisions shall be paid by the applicant.

1703.4.2 Research reports. Supporting data, where necessary to assist in the approval of products, materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

1703.5 Labeling. ~~Where materials or assemblies are required by this code to be labeled, such materials and assemblies shall be labeled by an approved agency in accordance with Section 1703.~~ Products, ~~and~~ materials or assemblies required to be labeled shall be labeled in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.4.

1703.5.1 Testing. An approved agency shall test a representative sample of the product, ~~or~~ material or assembly being labeled to the relevant standard or standards. The approved agency shall maintain a record of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard.

1703.5.2 Inspection and identification. The *approved agency* shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be *labeled*. The inspection shall verify that the labeled product, ~~or~~ material or assembly is representative of the product, ~~or~~ material or assembly tested.

1703.5.3 Label information. The *label* shall contain the manufacturer's ~~or distributor's~~ identification, model number, serial number or definitive information describing ~~the product or material's~~ performance characteristics of the product, material or assembly and the *approved agency's* identification.

1703.5.4 Method of labeling. Information required to be permanently identified on the product, material or assembly shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.

Reason: The purpose for the proposal is to update the language in Sections 1703.4 and 1703.5 by correlating the references to "product," "material" and "assembly" for internal consistency. In Section 1703.5, the first sentence is deleted because it is superfluous given that the requirements for labeling in this section are specified in its subsections and the second sentence is sufficient to serve as charging language for the section.

In Section 1703.5.3, the reference to the distributor is deleted for consistency with the definition of "label" in Section 202, which specifies that the label is applied by the manufacturer. Note that Section 1703.5.3 requires the label to contain the identifications of the manufacturer and the approved agency and this is consistent with the definition of "label" that specifies the same identifications.

Note that separate proposals:

1. Delete "testing" from Section 1703.4 so that it reads "…approved agency…" and

Change "the applicant" to "the owner or the owner's authorized agent" in Section 1703.4.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S116-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1703.4 #1-S-BRAZIL.doc

S117–12

202, 1703.4, 1704.2.5.2, 1705.16.1, 1705.16.2, [F]909.18.8.2, [F]909.18.8.3, [F]1705.17.2

Proponent: Phillip Brazil P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

THIS IS A THREE PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IBC ADMINISTRATION COMMITTEE. PART III WILL BE HEARD BY THE IFC COMMITTEE AS SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCUTRAL

Revise as follows:

1703.4 Performance. Specific information consisting of test reports conducted by an *approved* ~~testing~~ agency in accordance with the appropriate referenced standards, or other such information as necessary, shall be provided for the *building official* to determine that the material meets the applicable code requirements.

1704.2.5.2 Fabricator approval. *Special inspections* required by Section 1705 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved* ~~*special inspection*~~ agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

1705.16.1 Penetration firestops. Inspections of penetration fire-stop systems that are tested and listed in accordance with Sections 714.3.1.2 and 714.4.1.2 shall be conducted by an approved ~~inspection~~ agency in accordance with ASTM E 2174.

1705.16.2 Fire-resistant joint systems. Inspection of fire-resistant joint systems that are tested and listed in accordance with Sections 715.3 and 715.4 shall be conducted by an approved ~~inspection~~ agency in accordance with ASTM E 2393.

PART II – IBC ADMINISTRATION

Revise as follows:

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

PART III – IFC

Revise as follows:

[F] 909.18.8.2 Qualifications. ~~*Special inspection*~~ Approved agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

[F] 909.18.8.3 Reports. A complete report of testing shall be prepared by the ~~special inspector or *special inspection*~~ *approved* agency. The report shall include identification of all devices by manufacturer, nameplate data, design values, measured values and identification tag or *mark*. The report shall be reviewed by the responsible *registered design professional* and, when satisfied that the design intent has been achieved, the responsible *registered design professional* shall seal, sign and date the report.

[F] 1705.17.2 Qualifications. ~~*Special inspection* agencies~~ *Special inspectors* for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

Reason: The purpose for the proposal is to update references to "approved agency" throughout the building code. Approved agencies (defined in Section 202) are regularly engaged in conducting tests and employ or retain special inspectors (also defined in Section 202) who are qualified to perform inspections, including special inspections.

In Section 1704.2.5.2, "registered" is deleted because no purpose is served by requiring a fabricator who is approved by the building official to also be registered with the same building official.

Note that a separate proposal changes "special inspections" to "testing" in the title of Section 909.18.8 and in Section 909.18.8.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S117-12

PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing: Committee:	AS	AM	D
Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE - ADMINISTRATION

Public Hearing: Committee:	AS	AM	D
Assembly:	ASF	AMF	DF

PART III – INTERNATIONAL FIRE CODE

Public Hearing: Committee:	AS	AM	D
Assembly:	ASF	AMF	DF

1703.4 #2-S-BRAZIL.doc

S118–12
1704.1, 1704.2.5.2, 1704.5 (New), 1705.12.3, 1910.5, 2207.5

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.1 General. This section provides minimum requirements for special inspections, the statement of special inspections, contractor responsibility, submittals to the *building official* and structural observations.

1704.2.5.2 Fabricator approval. *Special inspections* required by Section 1705 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the owner or the owner's authorized agent for submittal to the *building official* as specified in Section 1704.5 stating that the work was performed in accordance with the *approved construction documents*.

1704.5 Submittals to the building official. In addition to the submittal of reports of *special inspections* and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the *building official* after review and acceptance by a *registered design professional* and prior to the construction or work being performed for each of the following:

1. *Certificates of compliance* for the fabrication of structural, load-bearing or lateral load-resisting members or assemblies on the premises of an *approved fabricator* in accordance with Section 1704.2.5.2
2. *Certificates of compliance* for the seismic qualification of nonstructural components, supports and attachments in accordance with Section 1705.12.3
3. *Certificates of compliance* for *designated seismic systems* in accordance with Section 1705.12.4
4. Reports of preconstruction tests for shotcrete in accordance with Section 1910.5
5. *Certificates of compliance* for open web steel joists and joist girders in accordance with Section 2207.5

(Renumber subsequent sections)

1705.12.3 Seismic certification of nonstructural components. The *registered design professional* shall specify on the construction documents the requirements for certification by analysis, testing or experience data for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1705.12. *Certificates of compliance* shall be submitted to the *building official* as specified in Section 1704.5.

Revise as follows:

1910.5 Preconstruction tests. ~~When~~ Where preconstruction tests are required by ~~the *building official*~~ Section 1910.4, a test panel shall be shot, cured, cored or sawn, examined and tested prior to commencement of the project. The sample panel shall be representative of the project and simulate job conditions as closely as possible. The panel thickness and reinforcing shall reproduce the thickest and most congested area specified in the structural design. It shall be shot at the same angle, using the same nozzleman and with the same concrete mix design that will be used on the project. The equipment used in preconstruction testing shall be the same equipment used in the work requiring such testing, unless substitute equipment is *approved* by the *building official*. Reports of preconstruction tests shall be submitted to the *building official* as specified in Section 1704.5.

Revise as follows:

2207.5 Certification. At completion of manufacture, the steel joist manufacturer shall submit a *certificate of compliance* ~~in accordance with~~ to the owner or the owner's authorized agent for submittal to the *building official* as specified in Section ~~1704.2.5.2~~ 1704.5 stating that work was performed in accordance with *approved construction documents* and with SJI standard specifications.

Reason: The purpose for the proposal is to provide a new section (Section 1704.5) in the building code that comprehensively specifies the requirements for the submittal of reports and certificates related to construction that is subject to special inspections and tests required by Chapter 17 of the building code. Typically, these documents certify or otherwise verify that a material or product meets certain special requirements, or are alternatives to the general requirements, of the building code.

The items in new Section 1704.5 are typically references to provisions elsewhere in the building code or a referenced standard. The charging language of the new section specifies the requirements for submittal to the building official (e.g., by whom, after review and acceptance, and before the work begins) and the requirements apply equally to each listed submittal. The referenced provisions, however, contain additional requirements unique to each situation. The proposal modifies these provisions to be consistent with the submittal requirements in new Section 1704.5. For example, Item 2 requires submittal of the certificate of conformance "in accordance with Section 1705.12.3." Section 1705.12.3, in turn, requires submittal of the certificate of conformance "to the building official as specified in Section 1704.5." Similar language is found in Item 4 and corresponding Section 1910.5.

Item 1 is similar to Item 2 in that it requires submittal of the certificate of conformance "in accordance with Section 1704.2.5.2." Section 1704.2.5.2, however, requires submittal of the certificate of conformance to "the owner or the owner's authorized agent for submittal to the building official as specified in Section 1704.5...". This is because of the requirement in Section 1704.2.5.2 for submittal of the certificate of compliance by the approved fabricator and is done to avoid a conflict with new Section 1704.5. Similar language is found in Item 5 of new Section 1704.5 and corresponding Section 2207.5.

The charging statement in new Section 1704.5 states that the submittals are in addition to the submittal of reports of special inspections and tests because also listing them in the new section is not needed since this activity is already covered in Section 1704.2.4. It is also not advisable because the submittal of reports of special inspections and tests is the responsibility of approved agencies but the submittals listed in this new section are the responsibility of the owner or owner's authorized agent. Examples of reports of special inspections and tests submitted by approved agencies are: tests of concrete for strength, slump and air content (see Table 1705.3); tests of masonry units, grout and mortar (see Section 1705.4); and strength tests of shotcrete (see Table 1705.3).

Item 4 is included in new Section 1704.5 because the preconstruction tests required by Section 1910.4 are not also a requirement in Chapter 17 of the building code and requiring the submittal of test reports to the building official will enable the building official to verify, before construction begins, the validity of structural design assumptions based on the success of the preconstruction tests. Text requiring the submittal of the test reports to the building official is added to Section 1910.5 in conjunction with Item 4.

For Items 2 and 3 of new Section 1704.5, a separate proposal places the provisions of Section 1705.12.3 into two subsections (Sections 1705.12.3 and 1705.12.4) to provide effective charging language for the corresponding provisions in ASCE 7-10. In that proposal, requirements for the submittal of certificates of compliance to the building official are added to each subsection. This proposal for a new Section 1704.5 also adds a similar requirement to Section 1705.12.3 but the only purpose for doing so is to specify Section 1704.5. Should both proposals be approved by the ICC membership, our intent is that Section 1705.12.3 reads: "Certificates of compliance for the seismic qualification shall be submitted to the building official as specified in Section 1704.5;" and Section 1705.12.4 reads: "Certificates of compliance documenting that the requirements are met shall be submitted to the building official as specified in Section 1704.5."

Note that separate proposals:

1. Transfer the requirements of Section 1705.12.1 to new Section 1704.5;
2. Add additional requirements for submittals that are related to structural steel ;
3. Correlate the language in Section 1704.2.5 with the definition of "fabricated item" in Section 202;
4. Add additional requirements for submittals that are related to the welding of concrete reinforcement and anchor bolts;
5. Add additional requirements for submittals that are related to masonry;
6. Change "the owner" to "the owner or the owner's authorized agent";
7. Add a new Section 107.1.1 that correlates with this proposal; and
8. Add "responsible" before "registered design professional".

Cost Impact: The code change proposal will not increase the cost of construction.

S118-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.1 #1-S-BRAZIL.doc

S119–12
1704.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.1 General. ~~This section provides minimum requirements for~~ Special inspections, ~~the~~ statements of special inspections, responsibilities of contractors ~~responsibility~~ and structural observations shall meet the applicable requirements of this section.

Reason: The changes revise the language from being declarative to being mandatory.

Cost Impact: The code change proposal will not increase the cost of construction.

S119-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.1 #2-S-BRAZIL.doc

S120–12
1704.2

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.2 Special inspections. Where application is made for construction as described in this section, the owner or the ~~*registered design professional in responsible charge* acting as the~~ owner's agent, other than the contractor, shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section 1705. These inspections are in addition to the inspections identified in Section 110.

Exceptions:

1. *Special inspections* are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
3. Special inspections are not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.
4. The contractor is permitted to employ the approved agencies where the contractor is also the owner.

Reason: The purpose for the proposal is to delete the requirement that only the registered design professional in responsible charge is permitted to serve as the owner's agent for employing an approved agency to perform special inspections and tests required by Section 1705 of the building code. We are not aware of any abilities of registered design professionals in responsible charge that make them uniquely qualified for this role.

The purpose for adding language to prohibit the contractor from employing the approved agencies is to prevent the contractor from serving as the owner's agent. The employment of approved agencies should be the responsibility of the owner. The contractor should not perform this function to avoid potential conflicts of interest. Note that Section 1703.1.1 requires the approved agency to be independent from the contractor responsible for the work being inspected. Exception #4 is added, however, to permit the contractor to do so where the contractor is also the owner.

Note that a separate proposal adds "authorized" before "agent" in Section 1704.2.

Cost Impact: The code change proposal will not increase the cost of construction.

S120-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2 #1-S-BRAZIL.doc

S121–12

1704.2, 1704.2.1, 1704.2.4

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.2 Special inspections. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to ~~perform~~ provide inspections during construction on the types of work listed under Section 1705 and identify them to the *building official*. These inspections are in addition to the inspections identified in Section 110.

Exceptions:

1. *Special inspections* are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
3. Special inspections are not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.

1704.2.1 Special inspector qualifications. Prior to the start of the construction, **t**he ~~special inspector~~ *approved agencies* shall provide written documentation to the building official demonstrating ~~his or her~~ the competence and relevant experience or training of the *special inspectors* who will perform the *special inspections* and tests during construction. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided they qualify as special inspectors.

1704.2.4 Report requirement. ~~Special inspectors~~ *Approved agencies* shall keep records of inspections. The ~~special inspector~~ *approved agency* shall furnish inspection reports to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the *building official*.

Reason: Section 1704.2 requires the owner or owner's agent to employ approved agencies to perform special inspections and tests required by Section 1705. The act of an owner or owner's agent to employ an approved agency for this purpose, however, is a private matter (typically contractual) and not an appropriate subject for a building code that requires compliance with its provisions. The proposal revises the language to require the owner or owner's agent to identify to the building official the approved agencies who will provide the special inspections and tests required by Section 1705 that will be performed by special inspectors and others (e.g., testing lab personnel) employed or retained by the approved agency.

Section 1704.2.1 requires special inspectors to provide documentation of their qualifications to the building official but it does not specify when this is required to occur. Being a subsection of Section 1704.2, Section 1704.2.1 also does not specify the relationship between the special inspector providing documentation of qualifications and the owner or owner's agent employing an approved agency. Special inspectors are employed or retained by an approved agency to perform special inspections (see definition of "special inspector" in Section 202). The proposal revises the language to require the approved agency to provide to the building official prior to the start of construction documentation of the qualifications for the special inspectors who will perform the special inspections and tests during construction.

An example of written documentation demonstrating the competence and relevant experience of an approved agency would be evidence of accreditation as an approved agency by the International Accreditation Service (IAS), Inc. The requirements for obtaining and maintaining such accreditation from the IAS are in the Accreditation Criteria for Special inspection Agencies, AC291. Notable provisions in AC291 are definitions, many of which are from 2012 IBC Section 202 (Section 2); information required to be submitted by the agency for accreditation (Section 3); requirements for inspection reports issued by the agency, including compliance with the reporting requirements of IBC Chapter 17 (Section 4); requirements for training, supervision and monitoring of special inspectors (Section 5); and minimum qualifications of special inspectors for specific classes of construction, including those in 2012 IBC Section 1705 (Section 6).

Section 1704.2.4 requires special inspectors to keep records of inspections and furnish inspection reports to the building official and the registered design professional in responsible charge. Special inspectors do generate records of their actions but these are typically kept for submittal by the approved agency that employs or retains them. Section 1704.2.4 is changed to require approved agencies to keep records of special inspections and tests and to submit the reports to the building official and the registered design professional in responsible charge.

Note that separate proposals also revise Section 1704.2 to:

1. Distinguish between special inspections and tests by approved agencies and inspections by the building official;
2. Clarify that the application is made to the building official as specified in Section 105 ; and
3. Update references to “approved agency” throughout the building code, including instances of “special inspection agency”.

Cost Impact: The code change proposal will not increase the cost of construction.

S121-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2 #2-S-BRAZIL.doc

S122–12
202, 1704.2

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.2 ~~Special inspections~~ Approved agency. Where application is made for to the *building official* construction as ~~described in this~~ specified in Section 105, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work ~~listed under~~ specified in Section 1705. These inspections are in addition to the inspections identified in Section 110.

Exceptions:

1. *Special inspections* are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
3. Special inspections are not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.

Revise as follows:

SECTION 202
DEFINITIONS

STRUCTURAL OBSERVATION. The visual observation of the structural system by a *registered design professional* for general conformance to the *approved construction documents*. Structural observation does not include or waive the responsibility for the inspections ~~required by~~ in Section 110~~,~~ or the *special inspections* in Section 1705 ~~or other sections of this code~~.

Reason: The current language in Section 1704.2 references that section for requirements applicable to applications for construction but Section 1704.2 contains no such requirements. The requirements for applications to the building official for permits are located in Section 105.

The definition of structural observation is revised because the current language refers to inspections in Section 110, Section 1705 or other sections of the code but Section 110 specifies inspections to be performed by the building official, Section 1705 specifies special inspections to be performed by special inspectors employed or retained by an approved agency, and there are no other sections in the *International Building Code* with inspections or special inspections to reference other than for smoke control systems, which are not subject to structural observations. The changes will also make the definition consistent with the last sentence of Section 1704.2 ("in addition to the inspections specified in Section 110").

Note that a separate proposal also revises Section 1704.2 to distinguish between special inspections and tests by approved agencies and inspections by the building official.

Cost Impact: The code change proposal will not increase the cost of construction.

S122-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2 #3-S-BRAZIL.doc

S123–12
1704.2.5, 1704.2.5.1, 1704.2.5.2, 1705.10 (NEW)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

1704.2.5 Special inspection of ~~fabricators~~ fabricated items. Where fabrication of structural load-bearing members and assemblies is being ~~performed~~ conducted on the premises of a fabricator's shop, *special inspection* of the fabricated items shall be ~~required by this section and as required elsewhere in this code~~ performed during fabrication.

Exceptions:

~~**1704.2.5.1 Fabrication and implementation procedures.**~~

1. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

~~**Exception:**~~

2. *Special inspections* ~~as required by Section 1704.2.5 shall~~ are not ~~be~~ required where the fabricator is registered and *approved* in accordance with Section 1704.2.5.2.

~~**1704.2.5.2**~~ **1704.2.5.1 Fabricator approval.** *Special inspections* ~~required by Section 1705~~ during fabrication are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

1705.10 Fabricated items. Special inspections of fabricated items shall be performed in accordance with Section 1704.2.5.

(Renumber subsequent sections)

Reason: Section 1704.2.5 requires special inspections to be performed for all structural load-bearing members and assemblies that are fabricated on the premises of a fabricator's shop (e.g., not at the construction site) as specified in the section and elsewhere in the building code. One example of this is the fabrication of metal-plate-connected wood trusses, which is subject to the special inspections required by Section 1704.2.5. Special inspections of the installation of the trusses at the construction site is not required except for trusses spanning 60 feet or greater (Section 1705.5.2).

A second example is the fabrication of precast, prestressed, concrete members (e.g., hollow-core slabs), which is also subject to the special inspections required by Section 1704.2.5 as well as those of Section 1705.3 for concrete construction. Note that Item 9 of Table 1705.3 specifies inspection of prestressed concrete.

Section 1704.2.5 requires special inspections of the fabricated items. Section 1704.2.5.1 specifies duties of the special inspector but these duties are not directly related to special inspections of the fabricated items. Instead, the specified duties are typical of what is conducted by an approved agency for the accreditation of a fabricator by a nationally recognized accreditation service such as the International Accreditation Service. Based on Section 1704.2.5, these duties are required in addition to special inspections of the fabricated items that are required elsewhere in the building code, such as for precast, prestressed, concrete members.

The proposal modifies the provisions in Section 1704.2.5 by requiring special inspections of fabricated items during fabrication. Section 1704.2.5.1 is changed to an exception making it an alternative to the basic requirement for special inspection in Section 1704.2.5.

The other changes in the proposal are made to clarify the language. Section 1705.10 is added because Section 1704.2.5 requires special inspections except where the work is done on the premises of an approved fabricator (Section 1704.2.5.2) and should be included in Section 1705, which specifies required special inspection and tests.

The current provisions in Section 1704.2.5.2 (renumbered to Section 1704.2.5.1 are an acknowledgement that there are fabricators who (1) fabricate products or assemblies with sufficient quality and through the application of documented procedures (e.g., quality management systems), and (2) and are recognized for this through certification, accreditation or qualification by a national recognized organization providing such services, that they should be exempt from further requirements for special inspection of fabrication. Examples are:

1. The certification program of steel fabricators and erectors by the American Institute of Steel Construction (AISC), which is audited by the Quality Management Company;
2. The accreditation of the fabrication inspection programs for reinforced concrete and precast/prestressed concrete, structural steel and wood wall panels by the International Accreditation Service (IAS) (see AC157, AC172 and AC196, respectively, for accreditation criteria);
3. The accreditation of the inspection programs for manufacturers of metal building systems by the International Accreditation Service (IAS) (see AC472 for accreditation criteria); and
4. Qualification of prefabricated items such as prefabricated wood shear panels, cold-formed, pin-connected open-web trusses with wood chords and tubular or angular steel webs, and steel lateral-force-resisting vertical assemblies, as alternatives to applicable requirements in the IBC or other codes by the ICC Evaluation Service (ICC-ES) (see AC130, AC306 and AC322, respectively, for acceptance criteria).
5. The certification of structural and architectural concrete products by the Precast, Prestressed Concrete Institute (PCI).
6. The certification of precast concrete products by the National Precast Concrete Association (NPCA).

Note that separate proposals:

1. Revise Section 1704.2.5.2 to specify that the approved fabricator is required to submit the certificate of compliance to the owner or the owner's authorized agent in conjunction with the requirement in proposed Section 1704.5 for submittal of the certificate to the building official;
2. Revise Sections 1704.2.5 and 1704.2.5.1 for consistency with and to correlate with the definition of "fabricated item" in Section 202; and
3. Revise Section 1704.2.5.2 and other sections to update references to "approved agency" throughout the building code.

Cost Impact: The code change proposal will not increase the cost of construction.

S123-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2.5 #1-S-BRAZIL.doc

S124–12
202, 1704.2.5, 1704.2.5.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.2.5 Inspection of fabricators. Where fabrication of structural, load-bearing or lateral load-resisting members ~~and~~ or assemblies is being ~~performed~~ conducted on the premises of a fabricator's shop, *special inspection* of the fabricated items shall be performed as required by this section and ~~as required~~ elsewhere in this code.

1704.2.5.1 Fabrication and implementation procedures. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for ~~inspection~~ control of the workmanship and the fabricator's ability to conform to *approved construction documents* and ~~referenced standards~~ this code. The special inspector shall review the procedures for completeness and adequacy relative to the ~~code~~ requirements ~~for~~ applicable to the fabricator's scope of work.

> **Exception:** *Special inspections* as required by Section 1704.2.5 shall not be required where the fabricator is *approved* in accordance with Section 1704.2.5.2.

Revise as follows:

SECTION 202
DEFINITIONS

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting members or assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standards ~~specifications~~ referenced by this code, such as rolled structural steel shapes, steel reinforcing bars, *masonry units* and wood structural panels, or in accordance with a referenced standard ~~which~~ that provides requirements for quality control done under the supervisions of a third-party quality control agency, ~~shall not be considered~~ are not "fabricated items."

Reason: The purpose for the proposal is to correlate the provisions for fabrication on the premises of a fabricator's shop. Section 1704.2.5 and the definition of "fabricated item" in Section 202 are revised for internal consistency. The change from "shall not be" to "are not" in the definition of "fabricated item" eliminates mandatory language, which is not appropriate in a definition. Also, "specifications" is deleted because the building code references standards, not specifications.

In Section 1704.2.5.1, "referenced standards" is replaced with "this code" for consistency with Section 102.4, which establishes that standards referenced by the building code are considered part of the code's requirements to the prescribed extent of the standard. The other changes are made because there are no requirements in the building code for the fabricator's scope of work and the requirements applicable to the fabricator are not limited to the requirements in the building code but also include what is specified in the approved construction documents.

Cost Impact: The code change proposal will not increase the cost of construction.

S124-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2.5 #2-S-BRAZIL.doc

S125–12
1704.2.5, 1704.2.5.1, 1704.2.5.2

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1704.2.5 Inspection of ~~fabricators~~ fabricated and pre-fabricated items. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, *special inspection* of the fabricated items shall be required by this section and as required elsewhere in this code.

~~**1704.2.5.1 Fabrication and implementation procedures.** The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.~~

~~**Exception:** *Special inspections* as required by Section 1704.2.5 shall not be required where the fabricator is *approved* in accordance with Section 1704.2.5.2.~~

~~**1704.2.5.2**~~ **1704.2.5.1 Fabricator approval.** *Special inspections* required by Section 1704.2.5 and Section 1705, except Sections 1705.10, 1705.11 and 1705.12 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

Reason: The proposed change in 1704.2.5 makes it clear that the special inspection is of the fabricated item, not the fabricator. The addition of the word "pre-fabricated" is needed due to the use of the word in 1703.6, and 1705.5. A related code change proposal adds a definition of "prefabricated item", equating it with "fabricated item."

Section 1704.2.5.1 is deleted because it is often confused with the review of the fabricator's quality control procedures that is done as part of the process of approving fabricators to perform work without special inspection. That task should only be done by a qualified auditor when the fabricator is seeking "approved fabricator" status in accordance with 1704.2.5.2 (here renumbered as 1704.2.5.1). As 1704.2.5 requires special inspection of the items being fabricated, verification of the fabricator's quality processes is not needed.

The exception to 1704.2.5.1 is deleted because the exception is adequately covered in 1704.2.5.2 (now renumbered as 1704.2.5.1).

The revision to the first sentence of 1704.2.5.2 is needed because the reorganization of Chapter 17 effected in the last code-change cycle merged all the special inspection requirements, including those for wind and seismic resistance, into Section 1705. The reference to Section 1705 would then allow the waiver of special inspection when work is performed in an approved fabricator's shop to be applicable to the wind-force resisting system in high wind areas and to the seismic force-resisting system. Code Change Proposal S109 07/08 specifically changed this section to clarify that the waiver would not apply to seismic.

Cost Impact: The code change proposal will not increase the cost of construction and may decrease the cost of construction in jurisdictions where the special inspector was performing the verification required by 1704.2.5.1.

S125-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2.5-S-KERR.doc

S126–12
1704.2.5, 1704.2.5.1, 1704.2.5.2

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute, representing American Institute of Steel Construction (bmanley@steel.org)

Revise as follows:

~~1704.2.5~~ <u>1704.3</u> Inspection of fabricators <u>and fabricated items</u>. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, *special inspection* of the fabricated items shall be required by this section and as required elsewhere in this code.

> <u>**Exception:** Special inspections as required by Section 1704.3.1 and Section 1705, except Sections 1705.10, 1705.11 and 1705.12, are not required where the work is done on the premises of a fabricator approved in accordance with Section 1704.3.2 to perform such work without special inspection.</u>

~~1704.2.5.1~~ <u>1704.3.1</u> Fabrication and implementation procedures. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

> ~~**Exception:** *Special inspections* as required by Section 1704.2.5 shall not be required where the fabricator is *approved* in accordance with Section 1704.2.5.2.~~

~~1704.2.5.2~~ <u>1704.3.2</u> Fabricator approval. ~~*Special inspections* required by Section 1705 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*.~~ Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

(Renumber subsequent sections)

Reason: This modification corrects the unintended consequences of modifications made by Proposal S116-09/10, effective with IBC 2012, which reorganized Chapter 17 and combined all special inspections and tests into Section 1705, including requirements for additional inspection and testing for wind resistance and seismic resistance. Previously, special inspections for wind resistance and seismic resistance had not been subject to the waiver of special inspections under the approved fabricators provisions, as demonstrated by the modifications made under Proposal S109-07/08, which appears in IBC 2009.

This modification also corrects the unintended consequences of modifications made by Proposal S116-09/10, effective with IBC 2012, which reorganized Section 1704, combining the provisions on inspection of fabricators, approved fabricators, and waiver of special inspections into the same numbering set as the general special inspection provisions.

This is first shown to be an unintended consequence with a modification made through Proposal S109–07/08 regarding 1704.2.2, which added the specific reference to Section 1704 into 1704.2.2, with the reason stated as follows:

> "This modification attempts to clarify exactly which inspections are permitted to be waived when work is done by a registered and approved fabricator. As written now, it could be interpreted to mean that the special inspections for seismic resistance required by Section 1707.2 could be waived. This is not appropriate and needs to be corrected."

This is also shown to be an unintended consequence in that IBC 2009 stated:

> "Section 1706.1 Special inspections for wind requirements. Special inspections itemized in Sections 1706.2 through 1706.4, unless exempted by the exceptions to Section 1704.1, are required ...
>
> Section 1707.1 Special inspections for seismic resistance. Special inspections itemized in Sections 1707.2 through 1707.9, unless exempted by the exceptions of Section 1704.1, 1705.3, or 1705.3.1, are required ....
>
> 1708.1 Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1708.2 through 1708.5, unless exempted from special inspections by the exceptions of Section 1704.1, 1705.3 or 1705.3.1 are required as follows: ... "

In IBC 2009, Section 1704.1 did not include the Approved Fabricator provisions, which were located in 1704.2.

With the reorganization for IBC 2012, the Approved Fabricator provisions were combined into the same number sequence as the previous 1704.1, with new provisions stated as follows:

> "1705.10 Special inspections for wind resistance. Special inspections itemized in Sections 1705.10.1 through 1705.10.3, unless exempted by the exceptions to Section 1704.2, are required for buildings and structures constructed in the following areas: ...
>
> 1705.11 Special inspections for seismic resistance. Special inspections itemized in Sections 1705.11.1 through 1705.11.8, unless exempted by the exceptions of Section 1704.2, are required for the following: ...
>
> 1705.12 Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1705.12.1 through 1705.12.4, unless exempted from special inspections by the exceptions of Section 1704.2 are required as follows: ... "

Therefore, for clarity, the Approved Fabricator provisions that were once distinct need to be renumbered separately from 1704.2 to avoid confusion with the provisions of 1705.10, 1705.11 and 1705.12.

The language in 1704.2.5 led to confusion about whether the waiver of special inspections applied only to the review of the fabricator's procedures, the fabricated items, or both, as the exception appeared in Section 1704.2.5.1. Secondly, the exception was repeated in a different manner in Section 1704.2.5.2. The title of 1704.2.5 addressed fabricators only, and not the fabricated items. The term “registered” is not used for such purposes within the code, and therefore is deleted. The new organization and the combination of statements regarding waiver of special inspections is intended to resolve this confusion.

Cost Impact: This change will increase cost of fabricated items that fall under the requirements for additional inspection and testing for wind resistance and seismic resistance.

S126-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.2.5-S-MANLEY.doc

S127–12
1704.3.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.3.1 Content of statement of special inspections. The statement of special inspections shall identify the following:

~~1. The materials, systems, components and work required to have *special inspection* or testing by the *building official* or by the *registered design professional* responsible for each portion of the work.~~

(Renumber remaining items)

Reason: The purpose for the proposal is to delete the requirement that the statement of special inspections specify the special inspection or testing required to be performed by the building official or the registered design professional responsible for each portion of the work. The building official is required to perform inspections, not special inspections or tests, which are required to be performed by special inspectors employed or retained by approved agencies. IBC Section 104.4 requires the building official to perform all required inspections but the building official is permitted to accept certified reports of inspections by approved agencies or responsible individuals.

Section 1704.2 requires the owner or owner's agent to employ approved agencies to perform special inspections and tests required by Section 1705. There is no requirement in the building code for registered design professionals to perform special inspections or tests but Section 1704.2.1 permits them to act as special inspectors, provided they demonstrate in writing their "competence and relevant experience or training" to the building official. Section 1704.2.1 also permits the registered design professional in responsible charge and engineers of record involved in the design of the project to act as the approved agency and their personnel to act as special inspectors for the work they designed, provided they qualify as special inspectors. Qualification as special inspectors requires the same demonstration of "competence and relevant experience or training" as noted above.

The language in Section 1704.2.1 serves as an alternative to the requirement in Section 1704.2 for the owner or owner's agent to employ approved agencies to perform special inspections and tests required by Section 1705. Based on its definition in Section 202, an approved agency is "established and recognized" as being "regularly engaged in conducting tests or furnishing inspection services." Registered design professionals in responsible charge and engineers of record involved in the design of the project may not be so "established and recognized" but they are permitted to serve as an approved agency and their personnel are permitted to act as special inspectors for the work they designed, provided they demonstrate their qualifications to the building official. However, this does not establish a requirement for registered design professionals to perform special inspections or tests as specified in Item 1 of Section 1704.3.1.

Note that a separate proposal modifies current Item #4 of Section 1704.3.1 by changing "special inspection or testing" to "special inspections or tests".

Cost Impact: The code change proposal will not increase the cost of construction.

S127-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.3.1-S-BRAZIL.doc

S128–12
1704.3.1

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1704.3.1 Content of statement of special inspections. The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have *special inspection* or testing by the *building official* or by the *registered design professional* responsible for each portion of the work.
2. The type and extent of each *special inspection*.
3. The type and extent of each test.
4. Additional requirements for *special inspection* or testing for seismic or wind resistance as specified in Sections 1705.10, 1705.11 and 1705.12.
5. For each type of *special inspection*, ~~identification as to~~ whether it will be continuous *special inspection*, ~~or~~ periodic *special inspection*, or performed at a frequency in accordance with the notation used in the reference standard where the inspections are defined.

Reason: The quality assurance requirements of AISC 360 and AISC 341, which are referenced as the standard for special inspections and testing for structural steel, do not describe the frequency of the inspections as “periodic” or ”continuous.” Rather, detailed inspection tasks are defined, and the level of effort for each task is described by the terms “Observe” and “Perform”. This proposal accommodates this alternate approach to the frequency of special inspection.

Cost Impact: The code change proposal will not increase the cost of construction.

S128-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.3.1-S-KERR.doc

S129–12

1704.3.2, 1705.11.4, 1705.12, 1705.12.3, 1705.12.4 (New)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.3.2 Seismic requirements in the statement of special inspections. Where Section 1705.11 or 1705.12 specifies special inspections~~,~~ ~~testing or qualification~~ or tests for seismic resistance, the statement of special inspections shall identify the designated seismic systems and seismic force-resisting systems that are subject to the *special inspections* or tests.

1705.11.4 Designated seismic systems. The special inspector shall examine designated seismic systems requiring seismic qualification in accordance with Section ~~1705.12.3~~ 13.2.2 of ASCE 7 and verify that the *label*, anchorage ~~or~~ and mounting conforms to the *certificate of compliance*.

1705.12 Testing ~~and qualification~~ for seismic resistance. ~~The~~ Testing ~~and qualification~~ for seismic resistance is required as specified in Sections 1705.12.1 through ~~1705.12.4~~ 1705.12.5, unless exempted from *special inspections* by the exceptions of Section 1704.2 are required as follows:

1. The seismic force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F shall meet the requirements of Sections 1705.12.1 and 1705.12.2, as applicable.
2. Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F and subject to the certification requirements of ASCE 7 Section 13.2.2 shall comply with Section 1705.12.3.
3. Architectural, mechanical and electrical components in structures assigned to *Seismic Design Category* C, D, E or F and where the requirements of ASCE 7 Section 13.2.1 are met by submittal of manufacturer's certification, in accordance with Item 2 therein, shall comply with Section 1705.12.3.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1705.12.4.

1705.12.3 ~~Seismic certification of~~ Nonstructural components. . For *structures* assigned to *Seismic Design Category* B, C, D, E or F, where the requirements of Section 13.2.1 of ASCE 7 for nonstructural components, supports or attachments are met by seismic qualification as specified in Item 2 therein, the *registered design professional* shall specify on the construction documents the requirements for ~~certification~~ seismic qualification by analysis, testing or experience data ~~for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1705.12~~ *Certificates of compliance* for the seismic qualification shall be submitted to the *building official*.

1705.12.4 Designated seismic systems. For *structures* assigned to *Seismic Design Category* C, D, E or F and with *designated seismic systems* that are subject to the requirements of Section 13.2.2 of ASCE 7 for certification, the *registered design professional* shall specify on the *construction documents* the requirements to be met by analysis, testing or experience data as specified therein. *Certificates of compliance* documenting that the requirements are met shall be submitted to the *building official*.

(Renumber subsequent sections)

Reason: The provisions in Section 1705.12.3 are placed in two sections to provide effective charging language for the corresponding provisions in ASCE 7-10 for nonstructural components meeting special requirements and designated seismic systems, which differ substantially from each other. References to "certification" and "qualification" in this section as well as other sections in the proposal are also revised for consistency with the corresponding provisions of ASCE 7-10. Seismic qualification and certification are technical requirements that are covered by the provisions in ASCE 7-10 (Sections 13.2.1 and 13.2.2). What is relevant in the building code is the submittal of certificates of compliance (manufacturer's certification in ASCE 7-10) to the building official for verification that the requirements for seismic qualification and certification are met and language is added to both sections for this purpose.

The requirement to submit certificates of compliance to the building official is also added to both sections for consistency with corresponding language in ASCE 7-10. Items #1 and #2 in Section 13.2.2 of ASCE 7-10 both specify submittal "for approval to the authority having jurisdiction after review and acceptance by a registered design professional." Item #1 in Section 13.2.1 of ASCE 7-10 contains similar language. Item #2 in Section 13.2.1, however, specifies submittal but not to whom. This has been judged to be an oversight on the part of the ASCE 7 Committee whose membership includes two members of the WABO Technical Code Development Committee. This has been brought to the attention of the ASCE 7 Committee and a proposal that addresses the issue will be submitted for consideration in the next development cycle for the standard.

The current language in Section 1705.12.3 for the registered design professional to specify on the construction documents the requirements to be met by analysis, testing or experience data is not substantively changed by this proposal.

Also in Section 1705.12.3, the scope is expanded to include structures assigned to Seismic Category B. For a nonstructural component in a structure where the option of seismic qualification by analysis, testing or experience data in Section 13.2.1, Item 2, of ASCE 7-10 is chosen, the requirements to document the parameters for seismic qualification on the construction documents and to submit the certificate of compliance for seismic qualification to the building official will apply. These requirements, however, are the consequence of the owner, design team or construction team choosing to comply with Section 13.2.1 of ASCE 7-10 through seismic qualification rather than the design option in Section 13.2.1, Item 1 of ASCE 7-10.

Note that a separate proposal modifies the requirement in Sections 1705.12.3 and 1705.12.4 to submit certificates of compliance for consistency with the changes in that proposal by stating that they shall be submitted to the building official "as specified in Section 1704.5".

Cost Impact: The code change proposal will not increase the cost of construction.

S129-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.3.2-S-BRAZIL.doc

S130–12
1704.3.3, 1705.10

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

1704.3.3 Wind requirements in the statement of special inspections. Where Section 1705.10 specifies special inspection for wind ~~requirements~~ resistance, the statement of special inspections shall identify the main windforce-resisting systems and wind-resisting components that are subject to *special inspection*.

1705.10 Special inspections for wind resistance. *Special inspections* ~~itemized~~ for wind resistance specified in Sections 1705.10.1 through 1705.10.3, unless exempted by the exceptions to Section 1704.2, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where V_{asd} as determined in accordance with Section 1609.3.1 is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Category C or D, where V_{asd} as determined in accordance with Section 1609.3.1 is 110 mph (49 m/sec) or greater.

Reason: The purpose for the proposal is to correlate the language that specifies special inspections for wind resistance with separate proposals that make similar changes to Section 1705.11 on special inspections for seismic resistance and to Section 1705.12 on testing for seismic resistance .

Cost Impact: The code change proposal will not increase the cost of construction.

S130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.3.3-S-BRAZIL.doc

S131–12
202, 1704.5

Proponent: D. Kirk Harman, P.E., S.E., SECB, FACI, The Harman Group, representing the National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Revise as follows:

SECTION 202
DEFINITIONS

STRUCTURAL OBSERVATION. The visual observation of the structural system by a *registered design professional* for general conformance to the *approved construction documents*. ~~Structural observation does not include or waive the responsibility for the inspection required by Section 110, 1705 or other sections of this code.~~

Revise as follows:

1704.5 Structural observations. Where required by the provisions of Section 1704.5.1 or 1704.5.2, the owner shall employ a *registered design professional* to perform structural observations as defined in ~~Section 202~~ Chapter 2. Structural observation does not include or waive the responsibility for the inspections in Section 110 or the *special inspections* in Section 1705.

Prior to the commencement of observations, the structural observer shall submit to the *building official* a written statement identifying the frequency and extent of structural observations.

At the conclusion of the work included in the permit, the structural observer shall submit to the *building official* a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

Reason: The last sentence of the definition in section 202 is moved to section 1704.5 because rules and relationships to other requirements should not be in the definition. The sentence is slightly revised to distinguish between "inspections" and *special inspections* and the reference to "other sections of this code" is deleted as there are no other sections that deal with inspections. The first sentence in 1704.5 is revised to make reference to Chapter 2 where definitions are now located.

Cost Impact: The code change proposal will not increase the cost of construction.

S131-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5 #1-S-HARMAN.doc

S132–12
1704.5, 1704.5.1, 1704.5.2

Proponent: D. Kirk Harman, P.E., S.E., SECB, FACI, The Harman Group, representing the National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Revise as follows:

1704.5 Structural observations. Where required by the provisions of Section 1704.5.1 ~~or 1704.5.2,~~ the owner shall employ a *registered design professional* to perform structural observations as defined in ~~Section 202~~ Chapter 2.

Prior to the commencement of observations, the structural observer shall submit to the *building official* a written statement identifying the frequency and extent of structural observations.

At the conclusion of the work included in the permit, the structural observer shall submit to the *building official* a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

~~**1704.5.1 Structural observations for seismic resistance.** Structural observations shall be provided for those structures assigned to *Seismic Design Category* D, E or F where one or more of the following conditions exist:~~

1. ~~The structure is classified as *Risk Category* III or IV in accordance with Table 1604.5.~~
2. ~~The height of the structure is greater than 75 feet (22 860 mm) above the base.~~
3. ~~The structure is assigned to *Seismic Design Category* E, is classified as *Risk Category* I or II in accordance with Table 1604.5, and is greater than two *stories above grade plane*.~~
4. ~~When so designated by the *registered design professional* responsible for the structural design.~~
5. ~~When such observation is specifically required by the *building official*.~~

~~**1704.5.2 Structural observations for wind requirements.** Structural observations shall be provided for those structures sited where V_{asd} as determined in accordance with Section 1609.3.1 exceeds 110 mph (49 m/sec), where one or more of the following conditions exist:~~

1. ~~The structure is classified as *Risk Category* III or IV in accordance with Table 1604.5.~~
2. ~~The *building height* of the structure is greater than 75 feet (22 860 mm).~~
3. ~~When so designated by the *registered design professional* responsible for the structural design.~~
4. ~~When such observation is specifically required by the *building official*.~~

1704.5.1 Structural observations of the structural system. *Structural observations* shall be provided where one or more of the following conditions exist:

1. The *building height*, or the height above the *grade plane* to the uppermost structural level of a non-building structure, is greater than 75 feet (22860 mm).
2. The structure has an occupant load greater than 500.
3. The structure is classified as *Risk Category* III in accordance with Table 1604.5, and is assigned to *Seismic Design Category* D, E, or F.
4. The structure is classified as *Risk Category* III in accordance with Table 1604.5, and is sited where V_{asd} as determined in accordance with Section 1609.3.1 exceeds 110 mph (49m/sec).
5. The structure is classified as *Risk Category* I or II in accordance with Table 1604.5, is assigned to *Seismic Design Category* E, or F and is greater than two *stories above the grade plane.*
6. The structure is classified as *Risk Category* IV in accordance with Table 1604.5.
7. Where required by the *registered design professional* responsible for the structural design.
8. Where such observation is specifically required by the *building official*.

Reason: Currently the code requires structural observation only in the limited situations of tall buildings or higher risk category structures located in high seismic and wind areas. It is the opinion of the National Council of Structural Engineers Associations that structural observation should be required for all large, or important, buildings anywhere in the country. It is well established that the quality of construction is increased when the engineer who designed the structure can verify that key construction conditions are in conformance with the design intent. Structural observation is meant to augment the detailed inspection provided by the special inspectors. It should be required wherever the consequence of structural failure is greater by virtue of complexity, size, occupancy, or risk.

Currently, a 7 story office building in San Francisco would require structural observation but a 60 story highrise or a 40000 seat stadium in New York would not. This proposal is intended to increase public safety by requiring that all similar structures are afforded the benefit of structural observation, not just the ones at risk of earthquakes or hurricanes.

Cost Impact: The code change proposal will not increase the cost of construction. It is generally held by many structural engineers that requirements stipulated by the building code will viewed as within the normal scope of services therefore it is not anticipated that there will be a general increase in engineering fees resulting from this proposal.

S132-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5 #2-S-HARMAN.doc

S133–12
1704.5 (NEW), Chapter 35 (NEW)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Add new text as follows:

1704.5 Submittals to the building official. In addition to the submittal of reports of *special inspections* and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the *building official* after review and acceptance by a *registered design professional* and prior to the construction or work being performed for each of the following:

1. Welding procedure specifications in accordance with Section 6.1.2 of AWS D1.4 for the welding of concrete reinforcement other than by fillet welds.
2. Test reports for Grade 55 anchor bolts verifying compliance with Supplementary Requirement S1 of ASTM F 1554 for weldability.
3. Test reports for Grade A and B anchor bolts verifying compliance with Supplementary Requirement S1 of ASTM A 307 for weldability.

Add new standard to Chapter 35 as follows:

ASTM

F1554-07a Standard Specification for Anchor Bolts, Steel, 36, 55 and 105-ksi Yield Strength

Reason: This proposal is a continuation of a separate proposal that adds a new Section 1704.5 specifying submittals to the building official. This proposal adds three items to those in the separate proposal and the charging language in new Section 1704.5 is identical in both proposals.

Item 1 is added to new Section 1704.5 because Section 6.1.2 of AWS D1.4 requires qualification testing for the welding procedure specifications (WPS) of all types of welded joints that include reinforcing bars except for those consisting of fillet welds, which are deemed to be prequalified and, thus, exempt from testing. Section 6.1.2.3 of the standard requires the WPS to be made available to those authorized to examine them. The requirement for availability means that welding procedure specifications are available for submittal to the building official. Requiring their submittal to the building official will enable the building official to verify whether the welded joints are adequately designed to meet applicable requirements. Note that the 1998 edition of AWS D1.4 is a referenced standard of the 2012 IBC (see Chapter 35) but the 2011 edition is the current edition.

Item 2 is added to new Section 1704.5 because Grade 55 anchor bolts complying with ASTM F 1554-07a are not suitable for welding but weldable steel is possible, provided the material for the bolts meets Supplementary Requirement S1 of the standard. In ASTM F 1554-07a, Section 4.2 classifies Grade 55 anchor bolts complying with Supplementary Requirement S1 as weldable, Section 5.1 requires orders for anchor bolts to include required test reports (Section 5.1.13), and Section 17.1 requires the purchaser to be furnished with a test report that includes the carbon equivalent in accordance with Supplementary Requirement S1 (Section 17.1.1). The requirement that the purchaser be furnished with the test reports means that they are available for submittal to the building official. Requiring their submittal to the building official will enable the building official to verify whether the anchor bolts meet the applicable requirements for weldability.

Grade 36 bolts complying with ASTM F 1554-07a are weldable because of the limits on carbon in Table 1 ("Chemical Requirements for Grade 36") of the standard, which are 0.26%-0.28% by heat analysis and 0.29%-0.31% by product analysis depending on the bolt diameter. Grade 55 anchor bolts not complying with Supplementary Requirement S1 are not weldable because of the lack of limits on carbon in Table 2 ("Chemical Requirements for Grades 55 and 105") of the standard. In Supplementary Requirement S1, Section S1.2 assumes that suitable welding procedures for the steel being welded and the intended service will be selected, Section S1.5.1 specifies limits on carbon of 0.30% by heat analysis and 0.33% by product analysis, Section S1.5.2 requires an analysis of the carbon equivalent (CE) verifying that limits on CE are met (0.45% for alloy and low-alloy steel and 0.40% for carbon steel), and Section S1.6 requires the anchor bolts to be designated by a white paint mark on the side of the bar to be encased in concrete.

Of the ASTM standards applicable to other commonly used anchor bolts, Table 2 ("Chemical Requirements") of ASTM A 36 for carbon steel shapes, plates and bars of structural quality limits carbon in bars to 0.26%-0.29% depending on nominal diameter; and Table 1 ("Chemical Requirements for Grades A and B Bolts and Studs") of ASTM A 307 for carbon steel bolts and studs limits carbon in Grade A and B bolts and studs to 0.29% by heat analysis and 0.33% by product analysis. ASTM A 307 Grade C bolts and studs are specified as having properties complying with ASTM A 36 (Section 1.1). The effect of these provisions is that anchor bolts with properties complying with ASTM A 36 (e.g., ASTM A 307, Grade C) are weldable but anchor bolts complying with ASTM A 307, Grade A or B, may not be weldable and the standard specifies additional requirements (Section 1.5) to ensure weldability (Supplementary Requirement S1) that are similar to those in ASTM F 1554-07a. Item 3 is added to new Section 1704.5 because of this.

Note that separate proposals:

1. Transfer the requirements of Section 1705.12.1 to new Section 1704.5 ;
2. Add additional requirements for submittals that are related to structural steel;
3. Add additional requirements for submittals that are related to masonry ; and
4. Add a new Section 107.1.1 that correlates with this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S133-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5 (NEW) #1-S-BRAZIL.doc

S134–12

1704.5 (NEW), Chapter 35 (NEW)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, representing self (pbrazil@reidmiddleton.com)

Add new text as follows:

1704.5 Submittals to the building official. In addition to the submittal of reports of *special inspections* and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the *building official* after review and acceptance by a *registered design professional* and prior to the construction or work being performed for each of the following:

1. Test reports verifying compliance with Supplementary Requirement S30 of ASTM A6 for W-shaped and WT-shaped elements of structural steel with flange thicknesses of 1-1/2 inches (38 mm) or greater that are required to have a Charpy V-notch toughness as specified in Section A3.3 of AISC 341;
2. Test reports verifying compliance with Supplementary Requirement S5 of ASTM A6 for structural steel plates of 2 inches (51 mm) in thickness or greater that are required to have a Charpy V-notch toughness as specified in Section A3.3 of AISC 341;
3. *Certificates of compliance* for verification that welds at elements of structural steel and their connections that are in the *seismic force-resisting system* are made with filler metal having a Charpy V-notch toughness as specified in Section A3.3a of AISC 341;
4. *Certificates of compliance* for verification that demand critical welds are made with filler metal having a Charpy V-notch toughness as specified in Section A3.3b of AISC 341;
5. Test reports verifying compliance with Supplementary Requirement S30 of ASTM A6 for hot-rolled shapes of structural steel with flange thicknesses greater than 2 inches (51 mm) that are required to have a Charpy V-notch toughness as specified in Section A3.1c of AISC 360;
6. *Certificates of compliance* for the fabrication of steel buckling-restrained braces on the premises of an *approved fabricator* in accordance with Section 1704.2.5.2.

Add new standard to Chapter 35 as follows:

ASTM

A 6-11 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling

Reason: This proposal is a continuation of a separate proposal that adds a new Section 1704.5 specifying submittals to the building official. This proposal adds six items to those in the separate proposal and the charging language in new Section 1704.5 is identical in both proposals. The parenthetic references to AISC 341-05 below are provided for reference and correspond to the referenced provisions of AISC 341-10. Similarly, there are parenthetic references to AISC 360-05 that correspond to the referenced provisions of AISC 360-10.

Items 1 and 2 are added to new Section 1704.5 because of the requirements in Section A3.3 of AISC 341-10 (Section 6.3 of AISC 341-05) for minimum Charpy V-notch (CVN) toughness in (1) hot rolled shapes of structural steel with flange thicknesses of 1-1/2 inches or greater, and (2) structural steel plates 2 inches in thickness or greater and meeting the condition specified therein, where they are elements of the seismic force-resisting system in structures within the scope of AISC 341. However, there are no provisions in AISC 341-10 (or AISC 341-05) for verification by the building official (authority having jurisdiction) that the requirements are met.

The condition specified in Section A3.3 of AISC 341-10 for steel plates is that Charpy V-notch (CVN) toughness is limited for (1) members built up from plate, (2) connection plates where inelastic strain under seismic loading is expected, and (3) the steel core of buckling-restrained braces. Note that there is apparently an error in Section A3.3 of AISC 341-10 for hot-rolled shapes in that the minimum flange thickness is specified as 1/2 inch (38 mm) but, given the stated thickness in millimeters, 1-1/2 inches is intended.

Section A3.3 of AISC 341-10 (Section 6.3 of AISC 341-05) requires the structural steel to comply with Section A3.1c of AISC 360-10 (Section A3.1c of AISC 360-05). For hot rolled shapes of structural steel with flange thicknesses greater than 2 inches and meeting the conditions specified therein, Section A3.1c of AISC 360-10 requires the construction documents (structural design documents) to specify that such shapes shall be supplied with CVN impact test results in accordance with ASTM A6, Supplementary Requirement S30. Assuming that it is not the intent for the shapes to supply the test results, it is assumed that the intent is for tests in accordance with ASTM A6, Supplementary Requirement S30 to be conducted on the shapes.

Section A3.3 of AISC 341-10 also requires the structural steel to be tested for CVN toughness as specified in ASTM A6, Supplementary Requirement S30, for hot-rolled shapes and in accordance with ASTM A 673 for steel plate. This has the effect of modifying the requirement in Section A3.1c of AISC 360-10 to lower the threshold for CVN impact testing of hot-rolled shapes of structural steel to those with flange thicknesses of 1-1/2 inches or greater and to also require CVN impact testing for structural steel plates that are 2 inches in thickness or greater. The requirement for test results means that test reports are available for submittal to the building official. Requiring their submittal to the building official will enable the building official to verify whether the structural steel meets the applicable requirements for CVN toughness.

In ASTM A 6-11, Section 1.8 indicates that the supplementary requirements therein are for use where additional testing or restrictions are required by the purchaser in the purchase order, Section 14.1 requires test reports for each heat supplied, and Section 14.1.6 requires the test reports to report the results of tests required by the purchase order. As for Section A3.1c of AISC 360-10 (discussed above), the requirement for test reports means that they are available for submittal to the building official, and requiring their submittal to the building official will enable the building official to verify whether the structural steel meets the applicable requirements for CVN toughness.

Supplementary Requirement S5 of ASTM A 6-11 requires CVN impact tests to be conducted in accordance with ASTM A 673 (Section S5.1). Supplementary Requirement S30 of ASTM A 6-11 requires CVN impact tests to be conducted in accordance with ASTM A 673 using specimens taken from the alternate core location (Section S30.1). This means that the supplementary requirements are identical in that both require impact testing in accordance with ASTM A 673 to determine CVN toughness except that Supplementary Requirement S30 imposes an additional condition on the testing, which is to take specimens from the alternate core location. Section A3.3 of AISC 341-10 references ASTM A 673 for steel plate but the proposal references Supplementary Requirement S5 of ASTM A 6-11 for consistency with the reference to Supplementary Requirement S30 of ASTM A 6-11 for hot-rolled shapes of structural steel.

Item 1 is limited in scope to W-shaped and WT-shaped structural members because the requirement in Section A3.3 of AISC 341-10 (Section 6.3 of AISC 341-05) for minimum CVN toughness is limited to hot-rolled shapes of structural steel with flange thicknesses of 1-1/2 inches or greater, which occur only in W-shaped and WT-shaped elements of structural steel. Section 3.1.2 of ASTM A 6-11 defines "shapes" as including "W" shapes, "HP" shapes, "S" shapes, "M" shapes, "C" shapes, "MC" shapes and "L" shapes. Of these shapes, the *AISC Steel Construction Manual* (thirteenth edition) only lists W-shaped and WT-shaped elements of structural steel with flange thicknesses of 1-1/2 inches or greater (Tables 1-1 and 1-8). Note that the *Manual* also does not list any "MT" shapes or "ST" shapes with flange thicknesses of 1-1/2 inches or greater.

The provisions in Section A3.3 of AISC 341-10 (Section 6.3 of AISC 341-05) and Section A3.1c of AISC 360-10 (Section A3.1c of AISC 360-05) are limited to hot-rolled shapes of structural steel but are not limited by type of shape. In Items 1 and 2 of this proposal, however, the requirement for submittal of test reports is limited by type of shape but is not limited to hot-rolled shapes of structural steel. The type of shape is limited to eliminate extraneous shapes for which the requirement for submittal does not apply. Limiting the requirement for submittal to shapes that are hot-rolled is not included because "hot-rolled" is a manufacturing process and is not relevant to the requirement for submittal. The "hot-rolled" limit is also not included for consistency with ASTM A 6-11 whose scope specifies the standard as applying to "rolled structural steel bars, plates, shapes and sheet piling" (Section 1.1).

Section A3.3 of AISC 341-10 and Section A3.1c of AISC 360-10 do specify hot-rolled shapes and the same is true of Section 6.3 of AISC 341-05 and Section A3.1c of AISC 360-05. None of these standards, however, define "hot-rolled" nor, to my knowledge, does any referenced standard of the 2012 IBC or any other standard referenced in the AISC standards listed above.

Items 3 and 4 are added to new Section 1704.5 because of the requirements in Sections A4.4a and A4.4b of AISC 341-10 (Sections 7.3a and 7.3b of AISC 341-05) for minimum CVN toughness of welds that are used in elements of structural steel and their connections that are in the seismic force-resisting system of structures within the scope of AISC 341. AISC 341-05 directly specifies the requirements. AISC 341-10 indirectly specifies them by referencing the requirements in Section (Clause) 6.3 of AWS D1.8. As for Items 1 and 2 of the proposal (discussed above), there are no provisions in AISC 341-10 (or AISC 341-05) for verification by the building official (authority having jurisdiction) that the requirements are met.

Section (Clause) 6.3 of AWS D1.8 (2009 edition) contains requirements for filler and weld metal of welds, including demand critical welds, that are within the scope of the standard. Among those requirements, Sections 6.3.1 and 6.3.5 specify mechanical properties for filler metals, including minimum CVN toughness, of welds and demand critical welds, respectively, which are listed in corresponding Tables 6.1 and 6.2. Note that AWS D1.8 is not a referenced standard of the 2012 IBC.

Section (Clause) 6.1.1 of AWS D1.8 requires welding procedure specifications to be prequalified, or to be qualified by testing in accordance with applicable AWS D1.1 requirements. Note that Section 1.1 of AWS D1.8 (1) establishes the applicability of AWS D1.8 as supplementing AWS D1.1 and (2) states that the provisions in AWS D1.1 apply to the welds governed by the provisions AWS D1.1 except where modified in AWS D1.8.

Section (Clause) 4.0 of AWS D1.1 (2008 edition) contains requirements for qualification testing of welding procedure specifications (WPS's). Section 3.1, however, exempts prequalified welding procedure specifications from requirements for qualification testing. A WPS is required to meet the provisions of Chapter 3 of AWS D1.1 in order to be prequalified. However, there are no provisions in Chapter 3 for minimum CVN toughness. Section 4.1.1.3 requires CVN tests to be included in the WPS qualification where required by the construction (contract) documents. Section 1.4.1(5) requires the Engineer to specify in the construction (contract) documents the CVN toughness criteria for weld metal (and base metal). Where notch toughness of welds used in elements of structural steel or their connections (welded joints) is required, Section 2.2.2 requires the Engineer to specify in the construction (contract) documents the minimum absorbed energy and corresponding test temperature for the filler metal (e.g., prequalified) or to specify that the WPS shall be qualified by CVN tests.

The effect of these provisions in AWS D1.1 is that the standard specifies CVN impact testing for qualification of welded joints to meet specified requirements for minimum CVN toughness. The standard does not prevent a prequalified WPS from being qualified to meet requirements for minimum CVN toughness but verification is only possible through review of the WPS. Section 3.1 of the standard requires all prequalified welding procedure specifications to be written. This requirement means that prequalified welding procedure specifications are available for submittal to the building official. Where there are requirements for minimum CVN toughness, requiring the submittal of welding procedure specifications or equivalent documents (see below) to the building official will enable the building official to verify whether the welded joints meet the applicable requirements for CVN toughness.

Given the discussion above on the provisions in AWS D1.8 and D1.1, it would appear that the submittal of welding procedure specifications is needed to verify CVN toughness where required by Section A4.4a or A4.4b of AISC 341-10. AISC 341-10, however, presents another approach. Section J2 contains requirements for documents to be submitted or made available to the engineer of record. Section J2.1 requires the submittal of welding procedure specifications (Item 1); certificates of conformance from the manufacturer for electrodes, fluxes and shielding gases (Item 2); and, for demand critical welds, applicable manufacturer's certifications that the filler metal meets supplemental notch toughness requirements (Item 3). Given these requirements and for consistency with Section 1704.2.5.2 and other sections of the 2012 IBC, the submittal of certificates of compliance instead of welding procedure specifications is specified in Items 3 and 4. Note that Section J2 does not specify that the documents required to be submitted or made available to the engineer of record are also required to be submitted or made available to the authority having jurisdiction (building official).

Item 5 is added to new Section 1704.5 because of the requirement in Section A3.1c of AISC 360-10 (Section A3.1c of AISC 360-05) for minimum Charpy V-notch (CVN) toughness of heavy structural steel shapes (e.g., with flange thicknesses greater than 2 inches) and meeting several conditions specified therein. Section A3.1c requires the construction documents (structural design documents) to specify that such shapes shall be supplied with CVN impact test results in accordance with ASTM A6, Supplementary Requirement S30. The requirement for test results means that test reports are available for submittal to the building official. Requiring their submittal to the building official will enable the building official to verify whether the structural steel meets applicable requirements for CVN toughness.

Item 6 is added to new Section 1704.5 to enable the building official to verify that fabrication of the steel buckling-restrained braces, where it is conducted at a location other than the construction site, was performed in accordance with the building code, its referenced standards (e.g., AISC 341) and the approved construction documents. Otherwise, special inspection at the fabricator's shop should be conducted (see IBC Section 1704.2.5).

Note that separate proposals:

1. Transfer the requirements of Section 1705.12.1 to new Section 1704.5;
2. Add additional requirements for submittals that are related to the welding of concrete reinforcement and anchor bolts;
3. Add additional requirements for submittals that are related to masonry; and
4. Add a new Section 107.1.1 that correlates with this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S134-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5 (NEW) #2-S-BRAZIL.doc

S135–12
1704.5 (NEW)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Add new text as follows:

1704.5 Submittals to the building official. In addition to the submittal of reports of *special inspections* and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the *building official* after review and acceptance by a *registered design professional* and prior to the construction or work being performed for each of the following:

1. Reports of preconstruction tests for masonry where the prism test method of Section 2105.2.2 is used to determine the *compressive strength of masonry* in accordance with Section 1.19.3 of TMS 402/ACI 530/ASCE 5.
2. Reports of preconstruction tests of grout where the unit strength method of Section 2105.2.2 is used to determine the *compressive strength of masonry* in accordance with Section 1.19.3 of TMS 402/ACI 530/ASCE 5.

Reason: This proposal is a continuation of a separate proposal that adds a new Section 1704.5 specifying submittals to the building official. This proposal adds two items to those in the separate proposal and the charging language in new Section 1704.5 is identical in both proposals.

The items are added to new Section 1704.5 because Section 1.19.3 of TMS 402/ACI 530/ASCE 5 requires compliance with a Level C quality assurance program for engineered masonry in structures classified as Risk Category IV. Table 1.19.3 for Level C quality assurance requires the verification of the specified compressive strength of masonry, f_m, prior to construction. Section 1.19.6.2 requires the compressive strength of masonry to be determined in accordance with TMS 602/ACI 530.1/ASCE 6. Article 1.4.B.1 of TMS 602/ACI 530.1/ASCE 6 requires the determination to be done by the unit strength method or the prism test method. Determination by the prism test method is, therefore, not required but when it is chosen for the verification of f_m prior to construction it requires testing of compressive strength in accordance with ASTM C 1314 (Article 1.4.B.3), which becomes a preconstruction test. Item 1 is added because of this. When the unit strength method is chosen for the same purpose, the grout is required to be tested for compressive strength in accordance with ASTM C 1019 (Article 1.4.B.2b (3b), which also becomes a preconstruction test. Item 2 is added because of this. In each case, requiring the submittal of test reports to the building official will enable the building official to verify, before construction begins, the validity of structural design assumptions based on the success of the preconstruction tests.

Neither TMS 402/ACI 530/ASCE 5 nor TMS 602/ACI 530.1/ASCE 6 specifies submittals to applicable regulatory officials (e.g., building official or authority having jurisdiction). In TMS 402/ACI 530/ASCE 5, Section 1.19.4 requires the quality assurance program to set forth the procedures for reporting and review, and Item 1 in Tables 1.19.2 (Level B Quality Assurance) and 1.19.3 (Level C Quality Assurance) specifies verification of compliance with the approved submittals ("approved" is not defined in Section 1.6, Definitions). In TMS 602/ACI 530.1/ASCE 6, (1) Section 1.5.A specifies that written acceptance of submittals be obtained prior to use of the materials or methods requiring acceptance; (2) Section 1.5.B specifies the submittals; (3) Section 1.2 defines "acceptable/accepted" as being done by the architect/engineer and "architect/engineer" as the individual or firm that issues, or administers the work under, the drawings and specifications ("approved" is not defined); and (4) Sections 1.6.A and 1.6.B specify the services and duties of testing agencies and inspection agencies, respectively, including requirements for the owner to retain the agencies and the agencies to report results and submit final reports to the architect/engineer and contractor.

Note that separate proposals:

1. Transfer the requirements of Section 1705.12.1 to new Section 1704.5 ;
2. Add additional requirements for submittals that are related to structural steel ;
3. Add additional requirements for submittals that are related to the welding of concrete reinforcement and anchor bolts and
4. Add a new Section 107.1.1 that correlates with this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

S135-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5 (NEW) #3-S-BRAZIL.doc

S136–12
1704.5 (NEW), 1705.3.1, 1705.12.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.5 Submittals to the building official. In addition to the submittal of reports of *special inspections* and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the *building official* after review and acceptance by a *registered design professional* and prior to the construction or work being performed for each of the following:

1. Reports of material properties verifying compliance with the requirements of AWS D1.4 for weldability as specified in Section 3.5.2 of ACI 318 for reinforcing bars in concrete complying with a standard other than ASTM A 706 that are to be welded; and
2. Reports of mill tests in accordance with Section 21.1.5.2 of ACI 318 for reinforcing bars complying with ASTM A 615 and used to resist earthquake-induced flexural or axial forces in the special moment frames, special structural walls, or coupling beams connecting special structural walls, of *seismic force-resisting systems* in *structures* assigned to *Seismic Design Category* B, C, D, E or F.

1705.3.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. ~~Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 3.5.2 of ACI 318.~~

~~**1705.12.1 Concrete reinforcement.** Where reinforcement complying with ASTM A 615 is used to resist earthquake induced flexural and axial forces in special moment frames, special structural walls and coupling beams connecting special structural walls, in structures assigned to *Seismic Design Category* B, C, D, E or F, the reinforcement shall comply with Section 21.1.5.2 of ACI 318. Certified mill test reports shall be provided for each shipment of such reinforcement. Where reinforcement complying with ASTM A 615 is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.~~

Reason: This proposal is a continuation of a separate proposal that adds a new Section 1704.5 specifying submittals to the building official. This proposal adds two items to those in the separate proposal and the charging language in new Section 1704.5 is identical in both proposals.

The requirement in Section 1705.12.1 to provide certified mill test reports for reinforcement in special moment frames, special structural walls and coupling beams is relocated to Item 2 of new Section 1704.5 because the subject of Section 1705.12 is testing and qualification for seismic resistance but there is no testing specified in Section 1705.12.1. The submittal of certified mill test reports is specified but there is no corresponding requirement in ACI 318-11 that the reports be certified or that the act of submittal amounts to a "qualification." Also ACI 318 has consistently specified "mill tests" since the alternative to reinforcement complying with ASTM A 706 first appeared in the 1983 edition. The limitation in Section 1705.12.1 to reinforcement complying with ASTM A 615 is retained in Item 2 for consistency with the same limitation in the referenced section of ACI 318-11 (Section 21.1.5.2).

Relocating the requirement in Section 1705.12.1 to Item 2 of new Section 1704.5 has an additional benefit that is provided by the charging language in the new section. Section 1705.12.1 requires mill test reports to be provided with each shipment of reinforcement but that does not ensure the reports will be available to the owner, design team, construction team or building official. New Section 1704.5, however, requires the owner or authorized agent to submit the reports to the building official after review and acceptance by a registered design professional and prior to the construction or work begin performed. Also, the current requirement in Section 1705.12.1 that the reports be provided for each shipment means that they are available for submittal to the building official.

The charging language in Section 21.1.5.2 of ACI 318-11 specifies deformed reinforcement but Item 2 specifies reinforcing bars for consistency with (1) the basic requirement in Section 21.1.5.2 for compliance with ASTM A 706, which is limited in scope to "deformed and plain low-alloy steel bars…for concrete reinforcement" (Section 1.1), and (2) the alternative of compliance with ASTM A 615, which is limited in scope to "deformed and plain carbon steel bars for concrete reinforcement," provided the special requirements of Section 21.1.5.2 are also met.

The source document for some of the language in Section 1705.12.1 is the *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (Section 3.4.1.2 of FEMA 368 and Section 2.4.1.2 of FEMA 450-1).

In Item 1 of new Section 1704.5, the requirement in the last sentence of Section 1705.1.2.1 for chemical tests of reinforcement complying with ASTM A 615 that is to be welded is replaced with a requirement to submit reports of material properties for reinforcing bars complying with a standard other than ASTM A 706 that verify compliance with the requirements of AWS D1.4 for weldability. These changes correct several errors. First, the current language in Section 1705.1.2.1 is limited in scope to Seismic Design Categories B through F by that section, and to Seismic Design Categories C through F by the charging language in Section 1705.12 (Item 1), but verification of weldability is not a seismic issue. Verifying weldability is important for concrete reinforcement designed to resist all load effects, not merely seismic load effects.

Second, the current language in Section 1705.1.2.1 requires chemical tests of reinforcement be performed to determine weldability in accordance with Section 3.5.2 of ACI 318 but Section 3.5.2 of ACI 318 does not require chemical tests to be performed. Instead, it requires the ASTM specification to be supplemented by specifying a "report of material properties."

Third, Section 1705.12.1 requires the chemical tests for reinforcement complying with ASTM A 615 but Section 3.5.2 of ACI 318 specifies the report of material properties for reinforcement complying with a standard other than ASTM A 706. In ACI 318-11, specified standards other than ASTM A 615 and A 706 include A 955, A 996 and A 1035 (see Section 3.5.3.1).

Fourth, Section 1705.12.1 specifies concrete reinforcement but Section 3.5.2 of ACI 318 specifies reinforcing bars, which is done to exclude other types of concrete reinforcement such as plain reinforcement, headed shear studs, structural steel, steel pipe and steel tubing. Refer to Section 3.5, and the definition of "reinforcement" in Section 2.2, in ACI 318-11 for further information.

The language in Item 1 of new Section 1704.5 is consistent with the provisions in Section 3.5.2 of ACI 318 as discussed above. Section 3.5.2 of ACI 318 has consistently specified (1) a report of material properties, (2) a standard other than ASTM A 706 and (3) reinforcing bars, ever since the section first appeared in the 1977 edition. Section 3.5.2 also requires the applicable ASTM specifications for reinforcing bars to be "supplemented to require a report of material properties necessary to conform to the requirements in AWS D1.4." The requirement means that reports of material properties are available for submittal to the building official. Requiring their submittal to the building official will enable the building official to verify whether the reinforcing bars meet the applicable requirements for weldability.

For Items 1 and 2, neither ACI 318-11 nor ACI 301 ("Specifications for Structural Concrete," not an IBC referenced standard) specifies submittals to applicable regulatory officials (e.g., building official or authority having jurisdiction). In ACI 318, (1) Section 1.2.2 specifies the filing of calculations pertinent to the design with the contract documents when required by the building official, (2) Section 1.3.1 specifies inspection as required by the legally adopted general building code, and (3) Sections 1.3.2 through 1.3.4 specify requirements for the keeping and retention of inspection records, but (4) reports of mill tests and material properties are not included. In ACI 301-05, (1) Section 1.5.1 specifies that submittals required by the standard be submitted for review and acceptance; (2) Section 1.2 defines "submitted" as being provided to the architect/engineer for review **or** acceptance and "architect/engineer" as the individual or firm that issues the project drawings and specifications **or** administers the work under the contract documents ("approved" is not defined); (3) Section 1.5.2 specifies reporting by the testing agency of test results to the owner, architect/engineer and contractor; and (4) Section 1.6.2 specifies requirements for testing agencies, including acceptance by the architect/engineer before performing any work.

Note that Section 1.3.4 of AWS D1.4-98 requires the calculation of carbon equivalent for all reinforcing bars, including those complying with ASTM A 706. If mill test reports are not available to enable the calculation, chemical analysis is permitted to be performed. If the chemical composition is not known, special preheat temperatures are required (see Section 1.3.4.3).

Also, the likely source document for the current requirement to perform chemical tests, the *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (Section 3.4.1.3 of FEMA 368 and Section 2.4.1.3 of FEMA 450-1) did not require chemical tests to be performed. It required verification "that chemical tests have been performed to determine weldability in accordance with Section 3.5.2 of ACI 318."

Note that separate proposals:

1. Add additional requirements for submittals that are related to structural steel (Sxx-12/13);
2. Add additional requirements for submittals that are related to the welding of concrete reinforcement and anchor bolts (Sxx-12/13);
3. Add additional requirements for submittals that are related to masonry (Sxx-12/13); and
4. Add a new Section 107.1.1 that correlates with this proposal (Sxx-12/13).

Cost Impact: The code change proposal will not increase the cost of construction.

S136-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5 (NEW) #4-S-BRAZIL.doc

S137–12

1704.5.1, 1705.11, 1705.11.7, 1905.1.8, 2209.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.5.1 Structural observations for seismic resistance. Structural observations shall be provided for those structures assigned to *Seismic Design Category* D, E or F where one or more of the following conditions exist:

1. The structure is classified as *Risk Category* III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base as defined in Section 11.2 of ASCE 7.
3. The structure is assigned to *Seismic Design Category* E, is classified as *Risk Category* I or II in Accordance with Table 1604.5, and is greater than two *stories above grade plane*.
4. When so designated by the *registered design professional* responsible for the structural design.
5. When such observation is specifically required by the *building official*.

1705.11 Special inspections for seismic resistance. *Special inspections* itemized in Sections 1705.11.1 through 1705.11.8, unless exempted by the exceptions of Section 1704.2, are required for the following:

1. The seismic force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F in accordance with Sections 1705.11.1 through 1705.11.3, as applicable.
2. Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F in accordance with Section 1705.11.4.
3. Architectural, mechanical and electrical components in accordance with Sections 1705.11.5 and 1705.11.6.
4. Storage racks as defined in Section 11.2 of ASCE 7 that are in structures assigned to *Seismic Design Category* D, E or F in accordance with Section 1705.11.7.
5. Seismic isolation systems in accordance with Section 1705.11.8.

   Exception: Special inspections itemized in Sections 1705.11.1 through 1705.11.8 are not required for structures designed and constructed in accordance with one of the following:

   1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 35 feet (10 668 mm).
   2. The seismic force-resisting system of the structure consists of reinforced masonry or reinforced concrete; the design spectral response acceleration at short periods, *SDS*, as determined in Section
      1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 25 feet (7620 mm).
   3. The structure is a detached one- or two-family dwelling not exceeding two *stories above grade plane* and does not have any of the following horizontal or vertical irregularities in accordance with Section 12.3 of ASCE 7:
      3.1. Torsional or extreme torsional irregularity.
      3.2. Nonparallel systems irregularity.
      3.3. Stiffness-soft story or stiffness-extreme soft story irregularity.
      3.4. Discontinuity in lateral strength-weak story irregularity.

1705.11.7 Storage racks. Periodic *special inspection* is required during the anchorage of storage racks as defined in Section 11.2 of ASCE 7 that are 8 feet (2438 mm) or greater in height in structures assigned to *Seismic Design Category* D, E or F.

Revise as follows:

1905.1.8 ACI 318, Section 22.10. Delete ACI 318, Section 22.10, and replace with the following:

22.10 - Plain concrete in structures assigned to Seismic Design Category C, D, E or F.

22.10.1 - Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

(a) *Structural plain concrete basement, foundation or other walls below the base as defined in Section 11.2 of ASCE 7 are permitted in detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the thickness shall not be less than 71/2 inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.*

(b) *Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.*

Exception: *In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.*

(c) *Plain concrete footings supporting walls are permitted, provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. For footings that exceed 8 inches (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.*

Exceptions:

1. *In Seismic Design Categories A, B and C, detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls, are permitted to have plain concrete footings without longitudinal reinforcement.*
2. *For foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one bar shall be provided at the top of the stemwall and at the bottom of the footing.*
3. *Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.*

Revise as follows:

2209.1 Storage racks. The design, testing and utilization of ~~industrial steel~~ storage racks as defined in Section 11.2 of ASCE 7 and made of cold-formed or hot-rolled steel structural members, shall be in accordance with RMI/ANSI MH 16.1. Where required by ASCE 7, the seismic design of storage racks shall be in accordance with the provisions of Section 15.5.3 of ASCE 7, except that the mapped acceleration parameters, S_s and S_1, shall be determined in accordance with Section 1613.3.1.

Reason: The purpose for the proposal is to clarify the meaning of "base" and "storage rack," which are defined in ASCE 7-10 but are not also defined in the building code. Both of these terms have meanings that necessitate knowing their definitions to fully understand the technical provisions related to them. Therefore, the proposal adds references to Section 11.2 of ASCE 7-10 for their definitions. The only instances of these terms in the 2012 IBC where they are directly related to their corresponding definitions in ASCE 7-10 are in this proposal.

For storage racks, adding a reference to the definition in ASCE 7-10 in Section 1705.11.7 also has the effect of narrowing the scope to those that are defined. Note that "storage rack" is defined in ASCE 7-10 as including "industrial pallet racks, moveable shelf racks and stacker racks made of cold-formed or hot-rolled structural members;" but excluding "other types of racks such as drive-in and drive-through racks, cantilever racks, portable racks or racks made of materials other than steel."

Cost Impact: The code change proposal will not increase the cost of construction.

S137-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5.1-S-BRAZIL.doc

S138–12
1704.5, 1705.4, 1705.4.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1704.5 Structural observations. Where required by the provisions of Section 1704.5.1 or 1704.5.2, the owner shall employ a *registered design professional* to perform structural observations ~~as defined in Section 1702~~. Prior to the commencement of observations, the structural observer shall submit to the *building official* a written statement identifying the frequency and extent of structural observations. At the conclusion of the work included in the permit, the structural observer shall submit to the *building official* a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

1705.4 Masonry construction. Masonry construction shall be inspected and verified in accordance with TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6 quality assurance program requirements.

Exception: *Special inspections* shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, where they are part of structures classified as *Risk Category* I, II or III ~~in accordance with Section 1604.5~~.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

1705.4.1 Empirically designed masonry, glass unit masonry and masonry veneer in Risk Category IV. The minimum *special inspection* program for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, in structures classified as *Risk Category* IV~~, in accordance with Section 1604.5,~~ shall comply with TMS 402/ACI 530/ASCE 5 Level B Quality Assurance.

Reason: The purpose for the proposal is to delete language considered superfluous given the definitions in Section 202 for "structural observation" and "risk category." These are the only instances of such language in the structural chapters of the 2012 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

S138-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1704.5-S-BRAZIL.doc

S139–12
202, 1705.1, 1705.10.1, 1705.10.2, 1705.11, 1705.11.2, 1705.11.3, 1705.11.6

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Delete without substitution:

SECTION 202
DEFINITIONS

~~**MECHANICAL SYSTEMS.** For the purposes of determining seismic *loads* in ASCE 7, mechanical systems shall include plumbing systems as specified therein.~~

Revise as follows:

1705.1 General. Verification and inspection of elements and nonstructural components of buildings and structures shall be as required by this section.

1705.10.1 Structural wood. Continuous special inspection is required during field gluing operations of elements of the main windforce-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of ~~components within~~ elements of the main windforce-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

> **Exception:** *Special inspections* ~~is~~ are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other ~~components~~ elements of the main windforce-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1705.10.2 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the main windforce-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of ~~components within~~ elements of the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

> **Exception:** *Special inspections* ~~is~~ are not required for cold-formed steel light-frame shear walls braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11 Special inspections for seismic resistance. *Special inspections* itemized in Sections 1705.11.1 through 1705.11.8, unless exempted by the exceptions of Section 1704.2, are required for the following:

1. The seismic force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F in accordance with Sections 1705.11.1 through 1705.11.3, as applicable.
2. Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F in accordance with Section 1705.11.4.
3. ~~Architectural, mechanical and electrical~~ Nonstructural components in accordance with Sections 1705.11.5 and 1705.11.6.
4. Storage racks in structures assigned to *Seismic Design Category* D, E or F in accordance with Section 1705.11.7.

5. Seismic isolation systems in accordance with Section 1705.11.8.

   Exception: Special inspections itemized in Sections 1705.11.1 through 1705.11.8 are not required for structures designed and constructed in accordance with one of the following:

   1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 35 feet (10 668 mm).
   2. The seismic force-resisting system of the structure consists of reinforced masonry or reinforced concrete; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 25 feet (7620 mm).
   3. The structure is a detached one- or two-family dwelling not exceeding two *stories above grade plane* and does not have any of the following horizontal or vertical irregularities in accordance with Section 12.3 of ASCE 7:
      3.1. Torsional or extreme torsional irregularity.
      3.2. Nonparallel systems irregularity.
      3.3. Stiffness-soft story or stiffness-extreme soft story irregularity.
      3.4. Discontinuity in lateral strength-weak story irregularity.

1705.11.2 Structural wood. Continuous special inspection is required during field gluing operations of elements of the seismic force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of ~~components within~~ elements of the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

> **Exception:** *Special inspections* ~~is~~ are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other ~~components~~ elements of the seismic force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11.3 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the seismic force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of ~~components within~~ elements of the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

> **Exception:** *Special inspections* ~~is~~ are not required for coldformed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.

1705.11.6 Plumbing, mechanical and electrical components. *Special inspection* for plumbing, mechanical and electrical components shall be as follows:

1. Periodic special inspection is required during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to *Seismic Design Category* C, D, E or F;
2. Periodic special inspection is required during the anchorage of other electrical equipment in structures assigned to *Seismic Design Category* E or F;
3. Periodic special inspection is required during the installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to *Seismic Design Category* C, D, E or F;

4. Periodic special inspection is required during the installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to *Seismic Design Category* C, D, E or F; and
5. Periodic special inspection is required during the installation and anchorage of vibration isolation systems in structures assigned to *Seismic Design Category* C, D, E or F where the *construction documents* require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

Reason: The purpose for the proposal is to correlate the provisions of the building code related to nonstructural components with the corresponding provisions for nonstructural components in ASCE 7-10. Essentially, the seismic chapters of ASCE 7-10 apply to the seismic force-resisting system except for Chapter 13, which applies to nonstructural components. The language in these chapters consistency refers to the seismic force-resisting system in terms of structural members or elements, and to other materials or products that are required to be designed for resistance to seismic load effects as “nonstructural components.” Chapter 13 consistently uses the term “nonstructural component” until later in the chapter where there are individual requirements for groups of nonstructural components. Materials and products subject to the requirements of Chapter 13 are grouped according to whether they are architectural, mechanical or electrical components, and “nonstructural” is dropped because it is, by then, considered redundant. The proposal revises the corresponding provisions in the building code for consistency with this phraseology.

The definition of “mechanical system” is deleted because it isn’t a definition but a requirement, which is incorporated into the building code by adding “plumbing” to Section 1705.11.6. Also, the requirement in the definition that mechanical systems include plumbing systems for “the purposes of determining seismic loads in ASCE 7” serves no purpose in the building code. Section 1613.1 references ASCE 7 for the design and construction of structures to resist the effects of earthquake motions. Chapter 13 of ASCE 7-10 clearly indicates that plumbing systems are included in the provisions for mechanical systems.

In Item 3 of Section 1705.11, “architectural, mechanical and electrical” is replaced with “nonstructural” for consistency with Chapter 13 of ASCE 7-10 and because distinguishing among the groups of nonstructural components in Section 1705.11 serves no purpose but it does serve a purpose in Sections 1705.11.5 and 1705.11.6 where the requirements for architectural components differ from those for plumbing, mechanical and electrical components.

Cost Impact: The code change proposal will not increase the cost of construction.

S139-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.1-S-BRAZIL.doc

S140–12

1705.2, Table 1705.2.2, 1705.2.2.1.1, 1705.2.2.2, 1705.11.1, 1705.11.1.1 (NEW), 1705.11.1.2 (NEW), 1705.12.2, 1705.12.2.1 (NEW), 1705.12.2.2 (NEW)

Proponent: Bonnie Manley, P.E. American Iron and Steel Institute, representing American Institute of Steel Construction (bmanley@steel.org)

Revise as follows:

1705.2 Steel construction. The *special inspections* ~~for~~ and nondestructive testing of steel ~~elements of~~ construction in buildings, ~~and~~ structures, and portions thereof shall be ~~as required~~ in accordance with this section.

> **Exception:** *Special inspections* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, and grade for the main stress-carrying elements are capable of being determined. Mill test reports shall be identifiable to the main stress-carrying elements when required by the approved construction documents.

1705.2.1 Structural steel. Special inspections and nondestructive testing ~~for~~ of ~~structural steel~~ *structural steel elements* in buildings, structures, and portions thereof shall be in accordance with the quality assurance inspection requirements of AISC 360.

> **Exception:** Special inspection of railing systems composed of *structural steel elements* shall be limited to welding inspection of welds at the base of cantilevered rail posts.

1705.2.2 Cold-formed steel ~~construction other than structural steel~~ deck and reinforcing. Special inspections ~~for steel construction other than structural steel~~ of cold-formed steel deck and reinforcing steel in buildings, structures, and portions theeof shall be in accordance with Table 1705.2.2 and this section.

1705.2.2.1.1 Cold-formed steel deck. Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

~~**1705.2.2.2**~~ **1705.2.3 Cold-formed steel trusses spanning 60 feet or greater.** Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

TABLE 1705.2.2
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS OF ~~STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL~~ COLD-FORMED STEEL DECK AND REINFORCING STEEL

~~VERIFICATION AND INSPECTION~~TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Special inspection of welding: a. Cold-formed steel deck:			

~~VERIFICATION AND INSPECTION~~TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1) Floor and roof deck welds.	—	X	AWS D1.3
b. Reinforcing steel:			
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 or ACI 318: Section 3.5.2
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	—	
3) Shear reinforcement.	X	—	
4) Other reinforcing steel.	—	X	

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.

1705.11.1 Structural steel. Special inspections for seismic resistance shall be in accordance with Sections 1705.11.1.1 or 1705.11.1.2, as applicable.

1705.11.1.1 *Special inspections* ~~for structural steel~~ of structural steel seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** *Special inspections* ~~of structural steel~~ are not required in the seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B or C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.11.1.2 *Special inspections* of *structural steel elements* in seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F other than those covered in Section 1705.11.1.1, including struts, collectors, chords and foundation elements, shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** *Special inspections* of *structural steel elements* are not required in the seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B or C with a response modification coefficient, *R*, less than 3.

1705.12.2 Structural steel. Nondestructive testing for seismic resistance shall be in accordance with Sections 1705.12.2.1 or 1705.12.2.2, as applicable.

1705.12.2.1 Nondestructive testing ~~for~~ of structural steel seismic-force resisting systems in buildings and structures assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** Nondestructive testing ~~for structural steel~~ is not required in the seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B or C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.12.2.2 Nondestructive testing of *structural steel elements* in seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F other than those covered in Section 1705.12.2.1, including struts, collectors, chords and foundation elements, shall be performed in accordance with the quality assurance requirements of AISC 341.

Exception: Nondestructive testing of *structural steel elements* is not required in the seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B or C with a response modification coefficient, *R*, less than 3.

Reason: This comprehensive proposal not only makes a number of editorial modifications for clarification purposes, it also introduces into Chapter 17 the term and associated requirements for "structural steel elements", which is handled in a companion proposal for Chapter 22. In that companion proposal, the definition of "structural steel member" is recommended for replacement by "structural steel element", which is defined as follows:

> **STEEL ELEMENT, STRUCTURAL.** Any steel structural member of a building or structure consisting of rolled shapes, pipe, hollow structural sections, plates, bars, sheets, rods, or steel castings other than cold-formed steel or steel joist members.

The Chapter 22 companion proposal includes a comprehensive discussion in the reason statement – please refer to it for additional background. Building on that proposal's reason statement, this proposal coordinates the existing special inspection and nondestructive testing requirements with the new terminology for structural steel elements. In Section 1705.2.1, changes clarify that structural steel elements in buildings, structures and portions thereof are to be inspected and tested in accordance with the quality assurance requirements in AISC 360. Current code requirements limit the special inspections to "structural steel." The change to "structural steel elements" was made to explicitly include steel construction that is typically designed, fabricated, and constructed in accordance with AISC 360, but that does fall within the definition of structural steel in AISC 360 and the AISC Code of Standard Practice for Buildings and Bridges. An exception is provided for railing systems to reflect what is currently done for these systems and prevent the implementation of excessive requirements.

In Section 1705.11.1 on special inspections for seismic resistance the distinction is drawn between structural steel seismic-force resisting systems, which include the sixteen structural steel systems currently listed in ASCE 7-10, Table 12.2-1, and structural steel elements that work as struts, collectors, chords and foundation elements in seismic-force resisting systems composed of other structural materials. These structural steel elements should be inspected in accordance with the quality assurance requirements of AISC 341, if they are used in a seismic-force resisting system that relies heavily on non-elastic energy dissipation, in this case chosen as a system with a response modification coefficient, R, greater than 3. A parallel change is made in Section 1705.12.2 on nondestructive testing for seismic resistance.

Finally, the proposal includes a number of editorial modifications, including the following:

- It adds reference to "nondestructive testing" to clarify that the quality assurance provisions of AISC 360 and AISC 341covers not only special inspections but also testing of welds. The use of "nondestructive" is the appropriate industry terminology.
- It modifies "steel elements" to "steel construction" in order to match the terminology used in Chapter 22.
- It recognizes that special inspections and testing may be required in buildings, structures or *portions thereof*.
- It changes the title in Section 1705.2.2 to specifically recognize the types of steel construction covered – cold-formed steel deck and reinforcing steel and to get away from the use of "structural steel". Since the section is limited to cold-formed steel deck, Section 1705.2.2.2 on cold-formed steel trusses is shifted to a new sub-section, 1705.2.3.
- It clarifies that the requirements in Sections 1705.11.1 and 1705.12.2 apply to the seismic-force resisting systems of buildings and other structures.

Finally, it clarifies the appropriate SDCs for the requirements and exceptions in both Sections 1705.11.1 and 1705.12.2.

Cost Impact: The code change proposal will not increase the cost of construction.

S140-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.2#1-S-MANLEY.doc

S141–12

1705.2, 1705.2.1, 1705.2.2, Table 1705.2.2, 1705.2.2.1.1, 1705.2.2.2, 1705.11.1, 1705.12.2

Proponent: Bonnie Manley, P.E. American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1705.2 Steel construction. ~~The~~ *Special inspections* ~~for~~ and nondestructive tests of steel ~~elements of~~ construction in buildings, ~~and~~ structures, and portions thereof shall be ~~as required~~ in accordance with this section.

> **Exception:** *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, and grade for the main stress-carrying elements are capable of being determined. Mill test reports shall be identifiable to the main stress-carrying elements when required by the approved construction documents.

1705.2.1 Structural steel. Special inspections ~~for~~ and nondestructive testing of structural steel in buildings, structures, and portions thereof shall be in accordance with the quality assurance inspection requirements of AISC 360.

1705.2.2 Cold-formed steel ~~construction other than structural steel~~ deck and reinforcing steel. Special inspections ~~for steel construction other than structural steel~~ of cold-formed steel deck and reinforcing steel in buildings, structures, and portions thereof shall be in accordance with Table 1705.2.2 and this section.

1705.2.2.1.1 Cold-formed steel deck. Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

~~1705.2.2.2~~ **1705.2.3 Cold-formed steel trusses spanning 60 feet or greater.** Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

TABLE 1705.2.2
REQUIRED ~~VERIFICATION AND~~ SPECIAL INSPECTIONS OF ~~STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL~~ COLD-FORMED STEEL DECK AND REINFORCING STEEL

~~VERIFICATION AND INSPECTION~~TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Special ~~i~~Inspection of welding: a. Cold-formed steel deck:			
1) Floor and roof deck welds.	—	X	AWS D1.3
b. Reinforcing steel:			

~~VERIFICATION AND INSPECTION~~TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 or ACI 318: Section 3.5.2
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	—	
3) Shear reinforcement.	X	—	
4) Other reinforcing steel.	—	X	

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.

1705.11.1 Structural steel. *Special inspection*s ~~for~~ of structural steel in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** *Special inspections* of structural steel are not required in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B or C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.12.2 Structural steel. Nondestructive testing ~~for~~ of structural steel in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** Nondestructive testing ~~for~~ of structural steel is not required in the seismic-force resisting systems of buildings and structures assigned to *Seismic Design Category* B or C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

Reason: This proposal is primarily editorial in nature and makes the following modifications:

- It adds reference to “nondestructive testing” to clarify that Chapter 17 covers not only special inspections but also testing. The use of “nondestructive” is the appropriate industry terminology.
- It modifies “steel elements” to “steel construction” in order to match the terminology used in Chapter 22.
- It adds recognition that special inspections and testing may be required in buildings, structures or *portions thereof*.
- It changes the title in Section 1705.2.2 to specifically recognize the types of steel construction covered – cold-formed steel deck and reinforcing steel. Since the section is limited to cold-formed steel deck, Section 1705.2.2.2 on cold-formed steel trusses is shifted to a new sub-section, 1705.2.3.
- It adds reference to “special” inspections in Table 1705.2.2 and coordinates the title with the changes in the charging text.
- It clarifies that the requirements in Sections 1705.11.1 and 1705.12.2 apply to the seismic-force resisting systems of buildings and other structures.

Finally, it clarifies the appropriate SDCs for the requirements and exceptions in both Sections 1705.11.1 and 1705.12.2.

Cost Impact: The code change proposal will not increase the cost of construction.

S141-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.2#2-S-MANLEY.doc

S142–12

1705.2.2 (NEW), Table 1705.2.2, Chapter 35 (NEW)

Proponent: Thomas Sputo, Ph.D., P.E., S.E., Steel Deck Institute

Revise as follows:

1705.2.2 Cold-formed steel deck. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck shall be in accordance with the quality assurance inspection requirements of SDI QA/QC,

~~**1705.2.2**~~ **1705.2.3** ~~**Steel construction other than structural steel**~~ **Reinforcing steel.** Reinforcing steel special inspections ~~for steel construction other than structural steel~~ shall be in accordance with Table ~~1705.2.2~~ 1705.2.3 and this section.

TABLE ~~1705.2. 2~~ 1705.2.2.3 REQUIRED VERIFICATION AND INSPECTION OF ~~STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL~~ REINFORCING STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
~~1. Material verification of cold-formed steel deck:~~			
~~a. Identification markings to conform to ASTM standards specified in the approved construction documents.~~	—	~~X~~	~~Applicable ASTM material standards~~
~~b. Manufacturer's certified test reports.~~	—	~~X~~	-
1. ~~2~~. Inspection of welding:			
~~a. Cold-formed steel deck:~~			
~~1) Floor and roof deck welds.~~	—	~~X~~	~~AWS D1.3~~
a. ~~b~~. Reinforcing steel:			
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318: Section 3.5.2

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—	
3) Shear reinforcement.	X	—	
4) Other reinforcing steel.	—	X	

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.

~~**1705.2.2.1**~~ **1705.2.3.1 Welding.** Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 AND ACI 318.

~~**1705.2.2.1.1 Cold-formed steel.** Welding inspection and welding inspector qualification for coldformed steel floor and roof decks shall be in accordance with AWS D1.3.~~

~~**1705.2.2.1.2 Reinforcing steel.** Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.~~

Add new standard to Chapter 35 as follows:

Steel Deck Institute

SDI QA/QC-2011, Standard for Quality Control and Quality Assurance for Installation of Steel Deck.

Reason: The SDI QA/QC-2011 Standard contains provisions for quality assurance inspection of steel floor and roof deck, and is intended to coordinate with the requirements of AISC 360, as contained in Section 1705.2.1.

The Standard complies with the Special Inspection requirements of the 2012 IBC Chapter 17, and clarifies the scope of required inspections and responsibilities of both the installer's quality control personnel and the quality assurance inspector. The Standard contains tables of inspection tasks that specifically list inspection requirements for material verification, deck installation, welding, and mechanical fastening. These tables amplify and clarify the basic special inspection requirements for steel deck that were contained in the 2012 IBC, and bring all special inspection requirements for steel deck into one place.

This Standard contains the 2012 IBC requirements of using AWS D1.3 for weld quality and requiring material verification. This Standard was developed and approved through a consensus process under ANSI guidelines, and complies with ICC CP 28. This Standard, along with all other Steel Deck Institute (SDI) Standards, will be available for free download from the SDI website for all parties.

For review purposes, the SDI QA/QC-2011 Standard that is being proposed is available for download and review from this website: http://www.sputoandlammert.com/standard.html

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S142-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.2.2 (NEW)-S-SPUTO

S143–12
1705.2.2.2, 1705.5.2, 2211.3.3, 2203.4.1.3

Proponent: Mark Gilligan, P.E., S.E., representing self (mark@gilligan.name)

Revise as follows:

1705.2.2.2 Cold-formed steel trusses spanning 60 feet or greater. Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the ~~temporary installation restraint/bracing and the~~ permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

1705.5.2 Metal-plate-connected wood trusses spanning 60 feet or greater. Where a truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that ~~the temporary installation restraint/bracing and the~~ permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

Delete without substitution:

~~**2211.3.3 Trussses spanning 60 feet or greater.** The owner shall contract with a *registered design professional* for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/ bracing for trusses with clear spans 60 feet (18 288 mm) or greater. *Special inspection* of trusses over 60 feet (18 288 mm) in length shall conform to Section 1705.~~

~~**2303.4.1.3 Trusses spanning 60 feet or greater.** The owner shall contract with any qualified *registered design professional* for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing for all trusses with clear spans 60 feet (18 288 mm) or greater.~~

Reason: The provisions for temporary bracing need to be deleted since building departments do not have authority to enforce safety provisions during construction. The existing provisions deal with contractor's means and methods of construction. The ability to regulate in this area is pre-empted by Federal of State OSHA regulations thus local agencies do not have legal authority to regulate in this area and thus the model code should not contain these requirements.

There is no disagreement about the need for temporary bracing only with it being addressed in the building code. In addition to the legal argument, it is suggested that temporary bracing is an integral part of the installation procedures, thus separating the responsibility for design of temporary bracing from the responsibility for installation procedures will have a negative impact on construction safety.

Deleting these provisions does not alter the code requirements for permanent bracing nor the need to inspect the permanent bracing.

Cost Impact: The code change proposal will not increase the cost of construction.

S143-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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S144–12

1705.2.2, Table 1705.2.2, 1705.2.2.1, 1705.2.2.1.2, Table 1705.3

Proponent: Philip Brazil, P.E., S.E., Senior Structural Engineer, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1705.2.2 ~~Steel construction other than structural~~ Cold-formed steel deck. Special inspections ~~for steel construction other than structural~~ of cold-formed steel deck shall be in accordance with Table 1705.2.2 and this section.

TABLE 1705.2.2
REQUIRED VERIFICATION AND INSPECTION OF ~~STEEL CONSTRUCTION OTHER THAN STRUCTURAL~~ COLD-FORMED STEEL DECK

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]
1. Material verification ~~of cold-formed steel deck~~:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Inspection of welding:	—	—	
~~a. Cold-formed steel deck~~			
~~1~~ a. Floor and roof deck welds		X	AWS D1.3
~~b. Reinforcing steel:~~			
~~1. Verification of weldability of reinforcing steel other than ASTM A 706.~~	~~—~~	~~X~~	
~~2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.~~	~~X~~	~~—~~	~~AWS D1.4 ACI 318 Section 3.5.2~~
~~3. Shear reinforcement.~~	~~X~~	~~—~~	
~~4. Other reinforcing steel.~~	~~—~~	~~X~~	

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

1705.2.2.1 Welding. ~~Welding inspection and welding inspector qualification shall be in accordance with this section.~~ **~~1705.2.2.1.1 Cold-formed steel.~~** Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1–7.7	1910.4
~~2. Inspection of reinforcing steel welding in accordance with Table 1705.2.2, Item 2b.~~	—	—	~~AWS D1.4 ACI 318: 3.5.2~~	—

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
2. Inspection of reinforcing bar welding:				
a. Verification of weldability of reinforcing bars other than ASTM A 706.	–	X	AWS D1.4 ACI 318: 3.5.2	
b. Reinforcing bars resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	–		
c. Shear reinforcement.	X	–		
d. Other reinforcing bars.	–	X		
3. Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used.		X	ACI 318: 8.1.3, 21.2.8	1908.5, 1909.1
4. Inspection of anchors post-installed in hardened concrete members. [b]		X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1912.1
5. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2–5.4	1904.2.2, 1910.2, 1910.3
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.10
7. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1910.6, 1910.7, 1910.8
8. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11–5.13	1910.9
9. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic force-resisting system.	X X	—	ACI 318: 18.20 ACI 318: 18.18.4	—
10. Erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	—
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 6.1.1	—

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with ACI 355.2 or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

~~1705.2.2.1.2~~ 1705.3.1 Welding of reinforcing ~~steel~~ bars. ~~Welding~~ Special inspections of welding and ~~welding inspector~~ qualifications of *special inspectors* for reinforcing ~~steel~~ bars shall be in accordance with the inspection requirements of AWS D1.4 ~~and ACI 318~~ for *special inspection* and the qualification requirements of AWS D1.4 for *special inspector* qualification.

Reason: This proposal is a continuation of a separate proposal that correlates Tables 1705.2.2 and 1705.3.3 with ACI 318-11. The purpose for this proposal is to relocate the requirements for special inspection of reinforcing bar welding in concrete from Item 2b of Table 1705.2.2 for steel construction to Item 2 of Table 1705.3 for concrete construction. Reinforcing bars are related to concrete construction, not steel construction. Note that the referenced standard listed in Table 1705.2.2 for reinforcing bar welding is ACI 318 for structural concrete (e.g., not also for TMS 402/ACI 530/ASCE 5 for masonry structures).

The other changes in the proposal are a consequence of the relocation, which reduces the scope of Table 1705.2.2 to specifying special inspections of cold-formed steel deck. These other changes eliminate language that becomes superfluous with the relocation.

Note that separate proposals:

1. Make several modifications to the titles and column headings of Tables 1705.2.2 and 1705.3 that are related to special inspections and tests as well as continuous and periodic special inspection ; and
2. Further modify Item 2b of Table 1705.2.2 by replacing the last three listings under the item .

The final language in the titles and column headings of Tables 1705.2.2 and 1705.3 from this proposal and the proposal in Item #1 above is shown below for reference.

TABLE 1705.2.2
REQUIRED SPECIAL INSPECTIONS OF COLD-FORMED DECK

TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD [a]	IBC REFERENCE

Cost Impact: The code change proposal will not increase the cost of construction.

S144-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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S145–12

1705.2.2, Table 1705.2.2, 1705.2.2.1.1, 1705.5, Table 1705.5 (NEW), 1705.10.1, 1705.10.2, 1705.11.2, 1705.11.3

Proponent: D. Kirk Harman, The Harman Group, representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee.

Revise as follows:

1705.2.2 Steel construction other than structural steel. Special inspection for steel construction other than structural steel shall be in accordance with Table 1705.2.2 and this section.

Exceptions:

1. *Special inspection* of cold-formed steel light-frame construction for buildings and structures in Risk Category I shall not be required.
2. *Special inspection* of cold-formed steel light-frame construction for buildings and structures in Risk Category II that are 3 stories or less in height above grade plane and that are not included in Sections 1705.10 or 1705.11, shall not be required.

TABLE 1705.2.2
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Material verification of cold-formed steel deck and cold-formed steel light-frame construction:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturer's certified test reports.	—	X	
2. Inspection of welding:			
a. Cold-formed steel deck and cold-formed steel light-frame construction:			
1) Floor and roof deck welds.	—	X	AWS D1.3
2) Cold-formed steel light-frame construction welds.	---	X	AWS D1.3
b. Reinforcing steel:			
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318: Section 3.5.2
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and	X	—	

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
boundary elements of special structural walls of concrete and shear reinforcement.			
3) Shear reinforcement.	X	—	
4) Other reinforcing steel.	—	X	
3. Inspection of cold-formed steel light-frame construction including framing, shear walls, diaphragms and shear panels for conformance with the *approved construction documents:*			
a. Inspect member locations and sizes.		X	
b. Inspect bracing, strap bracing, drag strut and stiffener locations and sizes.		X	
c. Verify mechanical connectors including screws, powder actuated fasteners, bolts, anchor bolts, hold downs, anchors and other fastening components.		X	Applicable ASTM Standards
d. Inspect material thickness, grade and fastening of diaphragms, and sheathing for the lateral force resisting system.		X	
e. Inspect connections including plates and components; screw quantity, size and spacing; powder actuated fastener quantity size and location; bolt size and location; anchor bolt size, spacing and location; hold down size location and configuration; beam hangers and framing.		X	

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1705.10 Special inspections for wind resistance and Section 1705.11, Special inspections for seismic resistance.

1705.2.2.1.1 Cold-formed steel. Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks and cold-formed steel light-frame construction shall be in accordance with AWS D1.3.

1705.5 Wood construction. *Special inspections* of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5. *Special inspections* of site-built assemblies shall be in accordance with this section and Table 1705.5.

Exceptions:

1. *Special inspection* of wood construction for buildings and structures in Risk Category I shall not be required.
2. *Special inspection* of wood construction for buildings and structures in Risk Category II that are 3 stories or less in height above grade plane and that are not included in Sections 1705.10 or 1705.11 shall not be required.

TABLE 1705.5
REQUIRED VERIFICATION AND INSPECTION OF WOOD CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Inspection of wood construction including framing, shear walls, diaphragms and shear panels for conformance with the *approved construction documents:*			
a. Verify grade stamp on framing lumber, plywood and OSB.		X	
b. Inspect wood framing including layout, member sizes, blocking, bridging and bearing lengths.		X	
c. Verify mechanical connectors including screws, powder actuated fasteners, bolts, anchor bolts, hold downs, anchors and other fastening components.		X	Applicable ASTM Standards
d. Inspect diaphragms, shear walls and wood structural panel sheathing size and thickness; sizes of framing members at adjoining panel edges and nail or staple size and spacing.		X	
e. Inspect wood connections including plates and components; nail quantity, size and spacing; bolt size and location; anchor bolt		X	

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
size, spacing and location; hold down size location and configuration; beam hangers and framing.			

a. Where applicable, see Section 1705.10, Special inspections for wind resistance and Section 1705.11, Special inspections for seismic resistance.

1705.10.1 Structural wood. Continuous special inspection is required during field gluing operations of elements of the main windforce-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the main windforce-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

Exception: For buildings and structures in Risk Category I or II that are 3 stories or less in height above grade plane, *special inspection* is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main wind-force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1705.10.2 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the main windforce-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: For buildings and structures in Risk Category I or II and 3 stories or less in height above grade plane, *special inspection* is not required for cold- formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11.2 Structural wood. Continuous special inspection is required during field gluing operations of elements of the seismic force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

Exception: For buildings and structures in Risk Category I or II and 3 stories or less in height above grade plane *special inspection* is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the seismic force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11.3 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the seismic force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: For buildings and structures in Risk Category I or II and 3 stories or less in height above grade plane, s*pecial inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.

Reason: : NCSEA believes that light frame construction in wood and cold formed steel have become more commonly used for load bearing applications of significant height and in regions with moderate and high seismic and wind concerns. These types of construction should be subject to Special Inspections in a similar manner and to a comparable extent as other systems such as concrete, structural steel and masonry. There is a large group of buildings constructed with light frame construction that is not subject to the same requirements for Special Inspection as the same buildings constructed with structural steel, concrete or masonry. This proposal seeks to correct this deficiency in the Code.

This proposal provides requirements to be consistent across both wood and cold-formed steel systems to avoid any competitive advantage of one system over the other. This proposal will improve the consistency of special inspections across all of the major structural materials.

Exceptions are provided to limit the applicability of these provisions to exclude single and two family dwellings, small commercial, agricultural and buildings of lesser occupancies unless these minor structures are subject to the existing requirements of 1705.10 and 1705.11.

This proposal contains provisions addressing both wood frame and cold-formed steel light-frame construction together. This is an effort to address both systems in one change therefore avoiding any perception of one system having an advantage over the other regarding special inspection.

The proposed revisions to 1705.2 and 1705.5 improve the Special Inspection requirements for both wood and cold-formed steel light-frame construction in a manner consistent with Special Inspection requirements for structural steel, concrete and masonry.

The proposed revisions to 1705.10 and 1705.11 are to coordinate between the additional requirements for Special Inspections in high seismic and high wind conditions and the proposed provisions. The proposed changes to 1705.10 and 1705.11 do not reduce the requirements of these sections they only prevent the exceptions for these sections from conflicting with the new requirements. In addition, notes are added to the tables to refer to 1705.10 and 1705.11 for additional requirements.

There will be no increase in construction cost due to the increased Special Inspection that will take place. Currently structural engineers provide for these inspections in project specifications. However, individual requirements vary greatly and there is not a consistent level of requirements. Standardization of these requirements in the Code will reduce delays and added costs due to confusion created by varying specifications. The improved field quality assurance will improve safety and reduce field errors resulting in a savings in construction cost and schedule. The improved public safety and potential reduction in construction cost support adoption of this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

S145-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.2.2-SHARMAN.doc

S146–12
Table 1705.2.2

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing myself (pbrazil@reidmiddleton.com)

Revise as follows:

TABLE 1705.2.2
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Inspection of welding:	—	—	
a. Cold-formed steel deck			
1. Floor and roof deck welds		X	AWS D1.3
b. Reinforcing steel:			
1. Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318 Section 3.5.2
2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—	
3. Shear reinforcement.	X	—	
4. Other reinforcing steel.	—	X	
<u>3. Installation of open web steel joists and joist girders in accordance with the approved construction documents and steel joist placement plans</u>		<u>X</u>	

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

Reason: The purpose for this proposal is to require special inspections for the installation of open web steel joists and joist girders. Their structural design is sufficiently complex to warrant inspection from a person with the expertise of a special inspector who is approved by the building official as having the competence necessary to inspect the installation of the joists. Refer to the definitions of "special inspection" and "special inspector" for further information. Examples of the complexity of the structural design that warrant special inspection of the installation are the bearing seat attachments, field splices and bridging attachments.

The standard specifications for open web steel joists (SJI-K-2010 and SJI-LH/DLH-2010), joist girders (SJI-JG-2010) and composite steel joists (SJI-CJ-2010) by the Steel Joist Institute contain provisions for inspections but these are limited to inspections by the manufacturer before shipment to verify compliance and workmanship with the requirements of the specifications. Refer to Section 5.12 of SJI-K-2010, Section 104.13 of SJI-LH/DLH-2010, Section 1004.10 of SJI-JG-2010 and Section 104.13 of SJI-CJ-2010. The sections of the SJI standards noted above are also referenced in Section 4 of the codes of standard practice for steel joists and joist girders (no identifier) and composite steel joists (SJI-CJCOSP-2010). The identifiers cited above match those from the published documents but they are abbreviated in Chapter 35 of the 2012 IBC to K-10, LH/LDH-10, JG-10 and CJ-10, respectively; and are specified as SJI-K-1.1, SJI-LH/LDH-1.1, SJI-JG-1.1 and SJI-CJ-1.0, respectively, in Section 2207.1. Note that the codes of standard practice published by the Steel Joist Institute are not referenced standards of the 2012 IBC.

Cost Impact: The code change proposal will increase the cost of construction.

S146-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1705.2.2 #1-S-BRAZIL.doc

S147–12
Table 1705.2.2, Table 1705.3

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

TABLE 1705.2.2
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Inspection of welding:	—	—	
a. Cold-formed steel deck			
1. Floor and roof deck welds		X	AWS D1.3
b. Reinforcing ~~steel~~ bars:			
1. Verification of weldability of reinforcing ~~steel~~ bars other than ASTM A 706.	—	X	AWS D1.4 ACI 318 Section 3.5.2
2. Reinforcing ~~steel~~ bars resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—	
3. Shear reinforcement.	X	—	
4. Other reinforcing ~~steel~~ bars.	—	X	

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]	IBC REFERENCE
1. Inspection of ~~reinforcing steel~~ reinforcement, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1–7.7	1910.4
2. Inspection of reinforcing ~~steel~~ bar welding in accordance with Table 1705.2.2, Item 2b.	—	—	AWS D1.4 ACI 318: 3.5.2	—

(Portions of table not shown remain unchanged)

Reason: The purpose for the proposal is to update Tables 1705.2.2 and 1705.3 for consistency with ACI 318-11, which does not use the term "reinforcing steel" but does use "(concrete) reinforcement" and "reinforcing bars." In Section 2.2 of ACI 318-11, "deformed reinforcement" is defined as including bar mats, deformed wire and welded wire reinforcement as well as deformed reinforcing bars. Section 3.5.1 requires reinforcement in concrete to be deformed reinforcement except that plain reinforcement is permitted for spirals and prestressing steel and reinforcement consisting of headed shear studs, structural steel, steel pipe or steel tubing is also permitted. Section 3.5.2 on welding, however, only specifies reinforcing bars. Note that Section 2.2 of ACI 318-11 also defines "reinforcement," "plain reinforcement," "headed deformed bars," "prestressing steel" and "tendon."

Note that separate proposals:

1. Make several modifications to the titles and column headings of Tables 1705.2.2 and 1705.3 that are related to special inspections and tests as well as continuous and periodic special inspection; and
2. Further modify Item 2b of Table 1705.2.2 by relocating the language to Table 1705.3; and replacing the last three listings under the item.

The final language in the titles and column headings of Tables 1705.2.2 and 1705.3 from the proposal in Item #1 above is shown below for reference.

TABLE 1705.2.2
REQUIRED SPECIAL INSPECTIONS OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

TYPE	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD [a]	IBC REFERENCE

Cost Impact: The code change proposal will not increase the cost of construction.

S147-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1705.2.2 #2-S-BRAZIL.doc

S148–12
Table 1705.2.2

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

TABLE 1705.2.2
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturers' certified test reports.	—	X	
2. Inspection of welding:	—	—	
a. Cold-formed steel deck			
1. Floor and roof deck welds		X	AWS D1.3
b. Reinforcing ~~steel~~ <u>bars</u>:			
1. Verification of weldability of reinforcing ~~steel~~ <u>bars</u> other than ASTM A 706.	—	X	AWS D1.4 ACI 318 Section 3.5.2
~~2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.~~	~~X~~	~~—~~	
~~3. Shear reinforcement.~~	~~X~~	~~—~~	
~~4. Other reinforcing steel.~~	~~—~~	~~X~~	
2. <u>Single-pass fillet welds, maximum 5/16"</u>		<u>X</u>	
3. <u>All other welds</u>	<u>X</u>		

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspection for seismic resistance.

Reason: This proposal is a continuation of separate proposals that correlate Tables 1705.2.2 and 1705.3.3 with ACI 318-11 and relocate the requirements for special inspection of reinforcing bar welding from Table 1705.2.2 to Table 1705.3.3. The purpose for this proposal is to simplify the required extent (continuous or periodic) of special inspection for the welding of reinforcing bars, which is currently based on the structural design (e.g., resisting flexural, axial or shear forces). The proposal changes the extent to continuous special inspection of all welding of reinforcing bars except for single-pass fillet welds that are a maximum of 5/16-inch where periodic special inspection is permitted. This will also be consistent with the historical approach taken by the building code for the extent of special inspections related to welding.

Should this proposal and the proposal to relocate the requirements for special inspection of reinforcing bar welding from Table 1705.2.2 to Table 1705.3.3 both be approved by the ICC membership, our intent is that the language in this proposal at Item 2b of Table 1705.2.2 be placed in Item 2 of Table 1705.3 and that Item 2 of Table 1705.3 read as follows:

2. Inspection of reinforcing bar welding:				
a. Verification of weldability of reinforcing bars other than ASTM A 706.	—	X	AWS D1.4 ACI 318: 3.5.2	
b. Single-pass fillet welds, maximum 5/16"	—	X		
c. All other welds	X	—		

Note that a separate proposal also makes several modifications to the title and column headings of Table 1705.2.2 that are related to special inspections and tests as well as continuous and periodic special inspection.

Cost Impact: The code change proposal will not increase the cost of construction.

S148-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1705.2.2 #3-S-BRAZIL.doc

S149–12
202, 1705.3, 1705.11.6, 1705.12.3, 2105.1, 2105.2.2.2.1, 2204.2.1, 2207.4

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

SECTION 202
DEFINITIONS

SPECIFIED COMPRESSIVE STRENGTH OF MASONRY, f'_m. Minimum compressive strength, expressed as force per unit of net cross-sectional area, required of the *masonry* used in construction by the <u>approved</u> *construction documents*, and upon which the project design is based. Whenever the quantity f'_m is under the radical sign, the square root of numerical value only is intended and the result has units of pounds per square inch (psi) (MPa).

Revise as follows:

1705.3 Concrete construction. The *special inspections* and verifications for concrete construction shall be as required by this section and Table 1705.3.

Exception: *Special inspections* shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less above *grade plane* that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less above *grade plane* that are fully supported on earth or rock where:
   2.1. The footings support walls of light-frame construction;
   2.2. The footings are designed in accordance with Table 1809.7; or
   2.3. The structural design of the footing is based on a specified compressive strength, f'_c, no greater than 2,500 pounds per square inch (psi) (17.2 MPa), regardless of the compressive strength specified in the <u>approved</u> *construction documents* or used in the footing construction.
3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 MPa).
4. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.

1705.11.6 Mechanical and electrical components. *Special inspection* for mechanical and electrical components shall be as follows:

1. Periodic special inspection is required during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to *Seismic Design Category* C, D, E or F;
2. Periodic special inspection is required during the anchorage of other electrical equipment in structures assigned to *Seismic Design Category* E or F;
3. Periodic special inspection is required during the installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to *Seismic Design Category* C, D, E or F;
4. Periodic special inspection is required during the installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to *Seismic Design Category* C, D, E or F; and
5. Periodic special inspection is required during the installation and anchorage of vibration isolation systems in structures assigned to *Seismic Design Category* C, D, E or F where the <u>approved</u> *construction documents* require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

1705.12.3 Seismic certification of nonstructural components. The *registered design professional* shall specify on the approved construction documents the requirements for certification by analysis, testing or experience data for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1705.12.

Revise as follows:

2105.1 General. A quality assurance program shall be used to ensure that the constructed masonry is in compliance with the approved *construction documents*. The quality assurance program shall comply with the inspection and testing requirements of Chapter 17.

2105.2.2.2.1 General. The compressive strength of clay and concrete masonry shall be determined by the prism test method:

1. Where specified in the approved *construction documents*.
2. Where masonry does not meet the requirements for application of the unit strength method in Section 2105.2.2.1.

Revise as follows:

2204.2.1 Anchor rods. Anchor rods shall be set in accordance with the approved *construction documents*. The protrusion of the threaded ends through the connected material shall fully engage the threads of the nuts, but shall not be greater than the length of the threads on the bolts.

2207.4 Steel joist drawings. Steel joist placement plans shall be provided to show the steel joist products as specified on the approved *construction documents* and are to be utilized for field installation in accordance with specific project requirements as stated in Section 2207.2. Steel placement plans shall include, at a minimum, the following:

1. Listing of all applicable loads as stated in Section 2207.2 and used in the design of the steel joists and joist girders as specified in the approved *construction documents*.
2. Profiles for nonstandard joist and joist girder configurations (standard joist and joist girder configurations are as indicated in the SJI catalog).
3. Connection requirements for:
   3.1. Joist supports;
   3.2. Joist girder supports;
   3.3. Field splices; and
   3.4. Bridging attachments.
4. Deflection criteria for live and total loads for non-SJI standard joists.
5. Size, location and connections for all bridging.
6. Joist headers.

Steel joist placement plans do not require the seal and signature of the joist manufacturer's *registered design professional*.

Reason: The purpose for the proposal is to update references to "construction documents" in the building code. Section 107.1 contains the requirements for the submittal of construction documents with each permit application and Section 107.3 requires the building official to approve the construction documents for permit issuance. The building code typically specifies "construction documents" before permit issuance and "approved construction documents" after permit issuance but there are exceptions and this proposal adds "approved" for those cases.

The instances of "construction documents" not preceded by "approved" in the building code typically occur in provisions that require the designers to specify information in the construction documents or to design the building or structure to meet specified requirements. Compliance with these provisions is only possible before the construction documents are approved. These are located in Sections 104.2, 105.3(4), 105.3.1, 105.4, 107.1, 107.1, 107.2, 107.2.1, 107.2.2, 107.2.3, 107.2.4, 107.2.5, 107.3.1, 107.3.2, 107.3.3, 107.3.4.1, 414.1.3, 907.1.1, 909.2, 909.3, 909.4, 909.21.2, 1603.1, 1603.1.6, 1603.1.9, 1607.5, 1705.11.6(5), 1705.12.3, 1901.3, 2101.3, 2101.3.1, 2207.2, 2403.2, 3103.2, 3303.2, G104.2, H105.2, K104.1, K104.2 and K105.5.

The instances of “approved construction documents” in the building code are located in Sections 107.4, 107.5, 114.4, 202 (“certificate of compliance” and “structural observation”), 1704.2.4, 1704.2.5.1, 1704.2.5.2, 1705.2-Exc., 1705.6, 1705.8, 1705.9, 1705.13, 1705.14, 1810.3.5.2.2-Exc., 1910.7, 2207.5, and 2403.1; and Table 1705.2.2. Note that “approved” precedes “geotechnical report and the construction documents” in Sections 1705.6, 1705.8 and 1705.9. In Section 1705.7, however, “*approved*” precedes “*instruction documents*,” which is apparently an advertent error made during the development of the 2012 IBC. On August 9, 2011, I submitted a request to the ICC that this be posted as errata but, as of January 3, 2012, the submittal deadline for Group A change proposals, a posting for the 2012 IBC had not yet been made on the ICC website.

All instances of “construction documents” in the building code were considered and are either in the proposal or are listed in the paragraphs immediately above.

A separate proposal places the provisions of Section 1705.12.3 into two subsections (Sections 1705.12.3 and 1705.12.4) to provide effective charging language for the corresponding provisions in ASCE 7-10. Should both proposals be approved by the ICC membership, our intent is that Sections 1705.12.3 and 1705.12.4 both read: “…the *registered design professional* shall specify on the *approved construction documents* the requirements…”

A separate proposal deletes the definition of “specified” in Section 202. Should both proposals be approved by the ICC membership, our intent is that the definition be deleted.

Cost Impact: The code change proposal will not increase the cost of construction.

S149-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.3-S-BRAZIL.doc

S150–12
1705.3

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1705.3 Concrete construction. The *special inspections* and verifications for concrete construction shall be as required by this section and Table 1705.3. The following exceptions shall not apply where Section 1705.10 or 1705.11 invoke *special inspections* or where special inspection of column anchor bolts for structural steel lateral force resisting frames is required by Section 1705.11.1.

Exception: *Special inspections* shall not be required for:

~~1. Isolated spread concrete footings of buildings three stories or less above *grade plane* that are fully supported on earth or rock.~~

~~2~~1. *Isolated spread concrete footings and* continuous concrete footings supporting walls of buildings three stories or less above *grade plane* that are fully supported on earth or rock and where any of the following conditions apply:

~~2.1.~~ 1.1 The footings support walls of light-frame construction;

~~2.2.~~ 1.2 The footings are designed in accordance with Table 1809.7; or

~~2.3.~~ 1.3 The structural design of the footing is based on a specified compressive strength, f'_c, no greater than 2,500 pounds per square inch (psi) (17.2 MPa), regardless of the compressive strength specified in the *construction documents* or used in the footing construction.

~~3~~2. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 MPa).

~~4~~3. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.

~~5~~4. Concrete patios, driveways and sidewalks, on grade.

Reason: Special inspections for concrete include such items as proper mix, reinforcing steel, bolts installed in concrete, post-installed anchors, formwork, concrete placement, curing, etc. Under Exception 1, the building could be of any type (concrete, masonry, steel, light frame), utilize high-strength concrete, and have heavily-loaded "isolated" footings. This change proposal makes the exception for isolated spread footings subject to the same limitations as those for continuous footings.

Note also that there are no additional inspection requirements for concrete under 1705.10 (wind), 1705.11 (seismic) and 1705.12 (testing for seismic). Therefore, anchorage elements such as anchor bolts for holdowns or steel frames used in the lateral system would not require special inspection when used in conjunction with light-frame construction or at isolated footings. The proposed change ensures that, when special inspection for light-frame construction is required by Section 1705.10 or 1705.11, the placement of anchor bolts will require special inspection, and that the placement of anchor bolts for steel frames resisting seismic loads will also require special inspection.

Cost Impact: The code change proposal will increase the cost of construction.

S150-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.3-S-KERR.doc

S151–12

Table 1705.3, Table 1705.6, Table 1705.7, Table 1705.8

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]	IBC REFERENCE
1. ~~Inspection of~~ Inspect reinforcing steel, including prestressing tendons, and verify placement.	—	X	ACI 318: 3.5, 7.1–7.7	1910.4
2. ~~Inspection of~~ Reinforcing ~~steel~~ bar welding: ~~in accordance with Table 1705.2.2, Item 2b.~~	—	—	AWS D1.4 ACI 318: 3.5.2	—
a. Verify weldability of reinforcing bars other than ASTM A 706;	—	—		
b. Inspect single-pass fillet welds, maximum 5/16"; and		X		
c. Inspect all other welds	X			
3.~~Inspection of~~ Inspect anchors cast in concrete where allowable loads have been increased or where strength design is used.		X	ACI 318: 8.1.3, 21.1.8	1908.5, 1909.1
4.~~Inspection of~~ Inspect anchors post-installed in hardened concrete members. [b]		X	ACI 318: 3.8.6, 8.1.3, 21.1.8	1909.1
5.Verify~~ing~~ use of required design mix.	—	X	ACI 318: Ch. 4, 5.2–5.4	1904.2.2, 1910.2, 1910.3
6. 7. ~~At the time fresh concrete is sampled to~~ During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.10
7. ~~Inspection of~~ Inspect concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1910.6, 1910.7, 1910.8
8. ~~Inspection for~~ Verify maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11–5.13	1910.9
9. ~~Inspection of~~ Inspect prestressed concrete for: a. Application of prestressing forces~~.~~; and b. Grouting of bonded prestressing tendons ~~in the seismic force-resisting system~~.	 X X	—	ACI 318: 18.20 ACI 318: 18.18.4	—

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD [a]	IBC REFERENCE
10. Inspect erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
11. ~~Verification of~~ Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	—
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 6.1.1	—

(No change to footnotes)

TABLE 1705.6
REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	—	X
2. Verify excavations are extended to proper depth and have reached proper material.	—	X
3. Perform classification and testing of compacted fill materials.	—	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	—
5. Prior to placement of compacted fill, ~~observe~~ inspect subgrade and verify that site has been prepared properly.	—	X

TABLE 1705.7
REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify element materials, sizes and lengths comply with the requirements.	X	—
2. Determine capacities of test elements and conduct additional load tests, as required.	X	—
3. ~~Observe~~ Inspect driving operations and maintain complete and accurate records for each element.	X	—
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation elements.	X	—
5. For steel elements, perform additional inspections in accordance with Section 1705.2.	—	—

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
6. For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section 1705.3.	—	—
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	—	—

TABLE 1705.8
REQUIRED VERIFICATION AND INSPECTION OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. ~~Observe~~ Inspect drilling operations and maintain complete and accurate records for each element.	X	—
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	—
3. For concrete elements, perform additional inspections in accordance with Section 1705.3.	—	—

Reason: This proposal is a continuation of separate proposals that:

1. Correlate Tables 1705.2.2 and 1705.3.3 with ACI 318-11;
2. Relocate the requirements for special inspection of reinforcing bar welding from Table 1705.2.2 to Table 1705.3.3; and
3. Simplify the required extent of special inspection for the welding of reinforcing bars.

The primary purpose for this proposal is to revise Tables 1705.6, 1705.7 and 1705.8 for consistency with Table 1705.3 and to clarify the scope of special inspections in Table 1705.3. The changes from “inspection” to “inspect” in Table 1705.3 are made to reduce confusion with the provisions in the building code for inspections by building inspectors and special inspections by special inspectors. The changes from “observe” to “inspect” in Tables 1705.6, 1705.7 and 1705.8 are made to reduce confusion with the provisions in the building code for structural observation, which have been reported to us by several code users. The changes are also made for consistency with the definitions of “special inspection” and “special inspector” in Section 202.

The current language In Item 6 of Table 1705.3 specifies the performance of slump and air content tests “at the time fresh concrete is sampled to fabricate specimens for strength tests.” The effect of this is that Table 1705.3 does not specify the sampling of fresh concrete for the purpose of performing strength tests and the proposal changes Item 6 to do so.

The current language in Item 9 of Table 1705.3 limits special inspections of the grouting of bonded prestressing tendons to those that are elements of the seismic force-resisting system. In our judgment, it is equally important that the grouting of these tendons be subject to special inspections where they are elements of gravity or wind force-resisting systems and the proposal changes Item 9(b) to do so.

For Item 2 in Table 1705.3, our intent for the dashes opposite the charging language is that they be deleted.

Note that a separate proposal also makes several modifications to the title and column headings of Table 1705.3 that are related to special inspections and tests as well as continuous and periodic special inspection and the final language the title and column headings from that proposal is shown below.

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD [a]	IBC REFERENCE

Cost Impact: The code change proposal will not increase the cost of construction.

S151-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1705.3-S-BRAZIL.doc

S152–12
1705.5.1

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1705.5.1 High-load diaphragms. High-load diaphragms designed in accordance with Section 2306.2 shall be installed with *special inspections* as indicated in Section 1704.2. The special inspector shall inspect the wood structural panel sheathing to ascertain whether it is of the grade and thickness shown on the *approved* ~~building plans~~ *construction documents*. Additionally, the special inspector must verify the nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that the spacing between fasteners in each line and at edge margins agrees with the *approved* ~~building plans~~ *construction documents*.

Reason: The purpose for the proposal is to replace the term "building plans," which is not defined in the building code, with "construction documents," which is defined in Section 202. The instances of "building plans" in the proposal are the only ones in the 2012 *International Building Code* other than in Section 911.1.5(12) where the context is such that changing the term would not be appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

S152-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.5.1-S-BRAZIL.doc

S153–12
1705.5

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1705.5 Wood construction. *Special inspections* of the fabrication ~~process~~ of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5. ~~*Special inspections* of site-built assemblies shall be in accordance with this section.~~

Reason: Special inspection should be of the item, not the “process”. The last sentence is not necessary and confuses the issues. The next two sections of 1705.5 (regarding high-load diaphragms and metal-plate-connected wood truss bracing) state the special inspections required and do not need to be invoked by the deleted language.

Cost Impact: The code change proposal will not increase the cost of construction.

S153-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.5-S-KERR.doc

S154–12
1705.6, 1705.8, 1705.9

Proponent: Mark Gilligan, representing self (mark@gilligan.name)

Revise as follows:

1705.6 Soils. *Special inspections* for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1705.6. The *approved* ~~geotechnical report, and the~~ *construction documents* ~~prepared by the *registered design professionals*~~ shall be used to determine compliance. ~~During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the *approved* geotechnical report.~~

> **Exception:** Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.

1705.8 Cast-in-place deep foundations. *Special inspections* shall be performed during installation and testing of cast-in-place deep foundation elements as required by Table 1705.8. The *approved* ~~geotechnical report, and the~~ *construction documents* ~~prepared by the *registered design professionals*,~~ shall be used to determine compliance.

1705.9 Helical pile foundations. *Special inspections* shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the ~~*registered design professional in responsible charge*~~ approved construction documents. The *approved* ~~geotechnical report and the~~ *construction documents* ~~prepared by the *registered design professional*~~ shall be used to determine compliance.

Reason: This change makes it clear that special inspections will be based on the approved construction documents as is the rest of the work and not on the geotechnical report. The geotechnical report is not written to be enforceable as a document to direct the contractor or inspector. Thus the use of a geotechnical report by the contractor to construct the work or the inspectors to inspect it will create the potential for confusion.

The proper role of the geotechnical report is to communicate initial recommendations to the design team and as a resource document that provides information to the Contractor on existing ground conditions. Any criteria or direction needed by the contractor, that exists in the geotechnical report, must be included in the construction documents. The code does not say how the information will be incorporated in the construction documents but it is expected that the geotechnical engineer who prepared the report would play an active role in the process.

The last sentence is 1705.6 is not needed as the requirements for special inspection during fill placement are included as Item 4 in Table 1705.6.

Cost Impact: The code change proposal will not increase the cost of construction.

S154-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.6-S-GILLIGAN.doc

S155–12
1705.7.1 (NEW), 1705.8.1 (NEW)

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Add new text as follows:

1705.7.1 Special inspection by a registered design professional. Where higher allowable stresses are used in the design of driven deep foundations in accordance with Section 1810.3.2.8, special inspections shall be performed under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and deep foundations.

1705.8.1 Special inspection by a registered design professional. Where higher allowable stresses are used in the design of cast-in-place deep foundations in accordance with Section 1810.3.2.8, special inspections shall be performed under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and deep foundations.

Reason: The special requirements of Section 1810.3.2.8 that the installation of piles designed with higher allowable stresses must be done under the supervision of a registered design professional knowledgeable in the field of soil mechanics and deep foundations should be reflected here so that the special requirements for the qualifications of the special inspector are clarified.

A related proposal seeks to eliminate the special allowable stresses used in Chapter 18 for deep foundation elements, and eliminate the special requirements of Section 1810.3.2.8. If that proposal is accepted, this proposal is not necessary, as the special inspection requirements for deep foundation elements are adequate.

Cost Impact: The code change proposal will not increase the cost of construction.

S155-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.7.1 (NEW)-S-KERR.doc

S156–12

1705.10.1, 1705.10.1.1 (NEW), 1705.10.1.2 (NEW), 1705.10.1.3 (NEW), 1705.10.2, 1705.10.2.1 (NEW), 1705.10.2.2 (NEW), 1705.11.2, 1705.10.11.2.1 (NEW), 1705.10.11.2.2 (NEW), 1705.11.2.3 (NEW), 1705.11.3, 1705.11.3.1 (NEW), 1705.11.3.2 (NEW)

Proponent: Stephen Kerr, S.E., Structural Engineers Association of California (skerr@jwa-se.com)

Revise as follows:

1705.10.1 Structural wood. Special inspection for wood construction within the main windforce-resisting system shall be as required by this section. Special inspection for wood construction in accordance with this section shall also be provided where vertical elements of the main windforce-resisting system are comprised of other materials, such as steel frames and concrete or masonry shear walls. ~~Continuous special inspection is required during field gluing operations of elements of the main windforce-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the main windforce-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, and hold-downs.~~

> ~~**Exception:** *Special inspection* is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main windforce-resisting system where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.~~

1705.10.1.1 Field gluing operations. Continuous special inspection is required during field gluing operations of wood elements of the main windforce-resisting system.

1705.10.1.2 Shear walls. Periodic special inspection shall be required for the sheathing fastening, and for other connections within the shear wall. Such connections shall include hold-down or tie-down connections, sill plate and sole plate anchorage and connections, and connections between the top of the wall and the horizontal diaphragm above.

> **Exception:** Special inspection for wood shear walls is not required where the sheathing is gypsum board or fiberboard or where the fastener spacing along shear wall sheathing edges is more than 4 inches (102 mm) on center,

1705.10.1.3 Horizontal diaphragms. Periodic special inspection shall be required for the sheathing fastening, diaphragm chord connections and splices, and collector connections and fastening.

> **Exception:** Special inspection for horizontal wood diaphragms is not required where the sheathing is gypsum board or fiberboard or where the least fastener spacing along sheathing edges or diaphragm boundaries is more than 4 inches (102 mm) on center.

1705.10.2 Cold-formed steel light-frame construction. Special inspection for cold-formed light-frame construction within the main windforce-resisting system shall be as required by this section. Special inspection for cold-formed light-frame construction in accordance with this section shall be provided where vertical elements of the main windforce-resisting system are comprised of other materials, such as steel frames and concrete or masonry shear walls. ~~Periodic special inspection is required during welding operations of elements of the main windforce-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts), and hold-downs.~~

> ~~**Exception:** *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:~~

~~1. The sheathing is gypsum board or fiberboard.~~

~~2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c).~~

1705.10.2.1 Shear walls and strap-braced walls. Periodic special inspection shall be required for the sheathing fastening, the welding or screw attachment of the strap bracing, and for other connections within the shear wall or strap-braced wall. Such connections shall include hold-down or tie-down connections, bottom track anchorage and connections, and connections between the top of the wall and the horizontal diaphragm above.

Exception: Special inspection for cold-formed light-frame shear walls is not required where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, and the fastener spacing along sheathing edges is more than 4 inches (102 mm) on center.

1705.10.2.2 Horizontal diaphragms. Periodic special inspection shall be required for the sheathing fastening, welding or screw attachment of diagonal strap bracing, diaphragm chord connections and splices, and collector connections and fastening.

Exception: Special inspection for cold-formed light-frame horizontal diaphragms is not required where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the framing, and the least fastener spacing along sheathing edges or diaphragm boundaries is more than 4 inches (102 mm) on center.

1705.11.2 Structural wood. Special inspection for wood construction within the seismic force-resisting system shall be as required by this section. Special inspection for wood construction in accordance with this section shall be provided where vertical elements of the seismic force-resisting system are comprised of other materials, such as steel frames and concrete or masonry shear walls.~~Continuous special inspection is required during field gluing operations of elements of the seismic force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.~~

~~**Exception:** *Special inspection* is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main seismic force-resisting system where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c).~~

1705.11.2.1 Field gluing operations. Continuous special inspection shall be required during field gluing operations of wood elements of the seismic force-resisting system.

1705.11.2.2 Shear walls. Periodic special inspection shall be required for the sheathing fastening, and for other connections within the shear wall. Such connections shall include hold-down or tie-down connections, sill plate and sole plate anchorage and connections, and connections between the top of the wall and the horizontal diaphragm above.

Exception: Special inspection for wood shear walls is not required where the sheathing is gypsum board or fiberboard or where fastener spacing along shear wall sheathing edges is more than 4 inches (102 mm) on center,

1705.11.2.3 Horizontal diaphragms. Periodic special inspection shall be required for the sheathing fastening, diaphragm chord connections and splices, and collector connections and fastening.

> **Exception:** Special inspection for horizontal wood diaphragms is not required where the sheathing is gypsum board or fiberboard or where least fastener spacing along sheathing edges or diaphragm boundaries is more than 4 inches (102 mm) on center.

1705.11.3 Cold-formed steel light-frame construction. Special inspection for cold-formed light-frame construction within the seismic force-resisting system shall be as required by this section. Special inspection for cold-formed light-frame construction in accordance with this section shall be provided where vertical elements of the seismic force-resisting system are comprised of other materials, such as steel frames and concrete or masonry shear walls~~Periodic special inspection is required during welding operations of elements of the seismic force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts), and hold-downs.~~

> ~~**Exception:** *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:~~
>
> ~~1. The sheathing is gypsum board or fiberboard.~~
> ~~2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c).~~

1705.11.3.1 Shear walls and strap-braced walls. Periodic special inspection shall be required for the sheathing fastening, the welding or screw attachment of the strap bracing, and for other connections within the shear wall or strap-braced wall. Such connections shall include hold-down or tie-down connections, bottom track anchorage and connections, and connections between the top of the wall and the horizontal diaphragm above.

> **Exception:** Special inspection for cold-formed light-frame shear walls is not required where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, and the fastener spacing along sheathing edges is more than 4 inches (102 mm) on center.

1705.11.3.2 Horizontal diaphragms. Periodic special inspection shall be required for the sheathing fastening, welding or screw attachment of diagonal strap bracing, diaphragm chord connections and splices, and collector connections and fastening.

> **Exception:** Special inspection for cold-formed light-frame horizontal diaphragms is not required where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the framing, and the least fastener spacing along sheathing edges or diaphragm boundaries is more than 4 inches (102 mm) on center.

Reason: As currently written, it is not clear how to apply the exceptions to special inspection for wind and seismic as applicable to wood framing and cold-formed steel light frame construction (together "light-frame construction). The exceptions use "fastener spacing of the sheathing" as the trigger for special inspection. However, the following aspects of light-frame construction are not covered adequately by the exception language:

1. Fastener spacing for shear walls could vary throughout the building. It is not clear that the exception would only be applicable to the particular shear wall or diaphragm with the larger fastening spacing, and to the other elements of the lateral force-resisting system associated with that shear wall or diaphragm.
2. The main elements of the lateral force-resisting system of light-frame buildings are the shear walls and the horizontal diaphragms. Elements associated with the shear walls include hold-downs, and the parts use to make connection to the foundation or the horizontal diaphragms, including sill plates, sole plates, bottom tracks, and blocking and framing clips. Elements associated with the horizontal diaphragms include chords, collectors, and elements used to anchor concrete and masonry walls for out-of-plane forces (such as blocking, straps, and hold-down hardware used horizontally. As written, it is not clear when special inspection would be required for the elements associated with the shear walls and diaphragms.
3. Shear wall sheathing is fastened at the sheathing edges, and in the middle of the panel. It is not clear that the reference to sheathing fastening is intended to apply to fastening along sheathing edges.
4. Diaphragm sheathing fastening is often specified with different spacing at sheathing edges, and at diaphragm boundaries. It is not clear what fastening (edge or boundary) is being referred to, or what portions of a horizontal diaphragm and associated elements would be affected by the exception.
5. Buildings of pre-dominantly light-frame construction often use vertical lateral force-resisting elements made up of other materials, such as steel frames, or concrete shear walls or masonry shear walls. It is not clear under what conditions special inspection would be required for the elements used to connect such vertical lateral force-resisting elements to the light-frame building system.
6. Light-frame diaphragms are often used in buildings where all of the vertical lateral force-resisting elements are made up of other materials, such concrete tilt-up shear or masonry shear walls. It is not clear under what conditions special inspection would be required for the wood, light-frame, and/or steel elements used to anchor the concrete or masonry walls for out-of plane forces.

The proposed change includes similar revisions to the provisions for structural wood, and for cold-formed light-frame construction.

Shear walls and horizontal diaphragms are handled separately and the elements associated with each are identified. This makes it clear, once the special inspection is triggered (by fastener spacing, double sided sheathing, or the use of strap bracing) which elements other than the sheathing fastening, require inspection.

The requirements for inspection of anchorage elements in horizontal diaphragms for out-of-plane support of concrete and masonry walls are made explicit.

Cost Impact: The code change proposal will not increase the cost of construction.

S156-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.10.1-S-KERR.doc

S157–12
1705.10.2, 1705.11.3, 1705.11.5, 1705.11.6, 1705.11.7

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

1705.10.2 Cold-formed steel light-frame construction. Periodic special inspection is required ~~during~~ for welding operations of elements of the main windforce-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

> **Exception:** *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11.3 Cold-formed steel light-frame construction. Periodic special inspection is required ~~during~~ for welding operations of elements of the seismic force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

> **Exception:** *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.

1705.11.5 Architectural components. Periodic *special inspection* is required ~~during~~ for the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to *Seismic Design Category* D, E or F.

> **Exceptions:**
>
> 1. *Special inspection* is not required for exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet (9144 mm) or less in height above grade or walking surface.
> 2. *Special inspection* is not required for exterior cladding and interior and exterior veneer weighing 5 psf (24.5 N/m^2) or less.
> 3. *Special inspection* is not required for interior nonbearing walls weighing 15 psf (73.5 N/m^2) or less.

1705.11.6 Mechanical and electrical components. *Special inspection* for mechanical and electrical components shall be as follows:

1. Periodic special inspection is required ~~during~~ for the anchorage of electrical equipment for emergency or standby power systems in structures assigned to *Seismic Design Category* C, D, E or F;

2. Periodic special inspection is required ~~during~~ for the anchorage of other electrical equipment in structures assigned to *Seismic Design Category* E or F;
3. Periodic special inspection is required ~~during~~ for the installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to *Seismic Design Category* C, D, E or F;
4. Periodic special inspection is required ~~during~~ for the installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to *Seismic Design Category* C, D, E or F; and
5. Periodic special inspection is required ~~during~~ for the installation and anchorage of vibration isolation systems in structures assigned to *Seismic Design Category* C, D, E or F where the *construction documents* require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

1705.11.7 Storage racks. Periodic *special inspection* is required ~~during~~ for the anchorage of storage racks 8 feet (2438 mm) or greater in height in structures assigned to *Seismic Design Category* D, E or F.

Reason: The purpose for this proposal is to correlate the requirements for periodic special inspection in Section 1705 with the definition of periodic special inspection in Section 202, which defines it as special inspection "by the special inspector who is intermittently present where the work to be inspected **has been** (emphasis mine) or is being performed." The proposal changes "during," which is consistent with the definition of continuous special inspection, to "for," which is consistent with the definition of periodic special inspection. The proposal also makes the requirements for periodic special inspection in Section 1705 internally consistent in that the other requirements for periodic special inspection state "for" and not "during" (e.g., Sections 1705.10.1, 1705.10.3, 1705.11.2, 1705.11.5.1 and 1705.11.8).

For more information on the intent of the definition of periodic special inspection, as well the definitions of special inspection and continuous special inspection, refer to ICC Proposal S111-09/10-AMPC, notably the reason statement that accompanied the public comment.

Cost Impact: The code change proposal will not increase the cost of construction.

S157-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.10.2-S-BRAZIL.doc

S158–12
1705.10.2

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1705.10.2 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the main windforce-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of ~~components within~~ elements of the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

> **Exception:** *Special inspections* ~~is~~ are not required for cold- formed steel light-frame shear walls~~,~~ ~~braces,~~ and diaphragms ~~collectors (drag struts) and hold-downs~~, including screwing, bolting, anchoring, and other fastening to components of the seismic-force resisting system where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

Reason: This proposal makes minor changes to this section. In the exception, word "braces" is deleted, since Items 1 and 2 of the exception discuss only sheathing used on shear walls and not braced walls.
Revisions to the remainder of the section are to ensure consistency with the wood exception in Section 1705.10.1 and eliminate confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

S158-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.10.2-S-MANLEY.doc

S159–12
1705.10.3

Proponent: Stephen Kerr, S.E. Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1705.10.3 Wind-resisting components. Periodic special inspection is required for fastening of the following systems and components:

1. Roof ~~cladding~~ covering, roof deck, and roof framing connections.
2. ~~Wall cladding~~ Exterior covering, and wall connections to roof and floor diaphragms and framing.

Reason: The purpose of this change is to provide clarity and detail for the special inspection requirements for wind-resisting components in high-wind regions. The 2009 IBC identified “roof cladding and roof framing connections” and “wall connections to roof and floor diaphragms and framing” as wind-resisting components that needed to be included in the statement of special inspections, but only referenced “roof cladding” and “wall cladding” in the section describing the actual inspection. However, as part of the reorganization of Chapter 17 approved in the previous code change cycle, the more detailed language was deleted when the inspection requirements were combined with the requirements for inclusion in the statement of special inspections. In addition, “cladding” is not defined.

This proposal restores the more detailed description of the elements requiring special inspection, and uses terms defined in the code to identify the elements.

Cost Impact: The code change proposal will not increase the cost of construction.

S159-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.10.3-S-KERR.doc

S160–12
1705.11.1, 1705.12.2

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

1705.11.1 Structural steel. *Special inspection* for structural steel in the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** *Special inspections* of structural steel are not required in the *seismic force-resisting systems of* structures assigned to *Seismic Design Category B or* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.12.2 Structural steel. Testing ~~for~~ of structural steel in the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** Testing of structural steel is not required in the *seismic force-resisting systems* of structures assigned to *Seismic Design Category B or* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

Reason: The proposal correlates the requirements for special inspections and testing of structural steel in Section 1705.11.1 and 1705.11.2 with the applicability of AISC 341-10. The proposal is also a continuation of separate proposals that simplify the provisions of Section 1705.11 on required special inspections for seismic resistance and Section 1705.12.2 on required tests for seismic resistance. The changes in this proposal are identical to the changes in those proposals except Seismic Design Category B is added to the charging language and the exception in both sections of this proposal.

Summarizing, AISC 341-10 applies to:

1. The seismic force-resisting systems in structures assigned to Seismic Design Category D, E or F; and
2. The seismic force-resisting systems designed for a response modification coefficient, *R*, greater than 3 in structures assigned to Seismic Design Category B or C.

This is only a summary because there are additional details affecting the standard's applicability, including nonbuilding structures and cantilever column systems, but these details are not affected by the proposed changes.

Cost Impact: The code change proposal will increase the cost of construction.

S160-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11.1-S-BRAZIL.doc

S161–12
1705.11.3

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1705.11.3 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the seismic force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of ~~components within~~ elements of the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

> **Exception:** *Special inspections* ~~is~~ are not required for coldformed steel light-frame shear walls~~, braces,~~ and diaphragms, ~~collectors (drag struts) and hold-downs~~ including screw installation, bolting, anchoring, and other fastening to components of the seismic-force resisting system where either of the following apply:
>
> 1. The sheathing is gypsum board or fiberboard.
> 2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.

Reason: This proposal makes minor changes to this section. In the exception, word "braces" is deleted, since Items 1 and 2 of the exception discuss only sheathing used on shear walls and not braced walls.
Revisions to the remainder of the section are to ensure consistency with the wood exception in Section 1705.10.1 and eliminate confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

S161-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11.3-S-MANLEY.doc

S162–12
1705.11.5, 1705.11.6

Proponent: Philip Brazil, P.E., S.E., Senior Structural Engineer, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1705.11.5 Architectural components. Periodic *special inspection* is required during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to *Seismic Design Category* D, E or F.

Exception~~s~~: *Periodic special inspection* is not required for the following:

1. ~~*Special inspection* is not required for~~ Exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet (9144 mm) or less in height above grade or walking surface.
2. ~~*Special inspection* is not required for~~ Exterior cladding and interior and exterior veneer weighing 5 psf (24.5N/m^2) or less.
3. ~~*Special inspection* is not required for~~ Interior nonbearing walls weighing 15 psf (73.5 N/m^2) or less.

1705.11.6 Mechanical and electrical components. *Periodic special inspection* ~~for~~ of mechanical and electrical components ~~shall be as follows~~ shall be required for the following:

1. ~~Periodic special inspection is required during the~~ Anchorage of electrical equipment for emergency or standby power systems in structures assigned to *Seismic Design Category* C, D, E or F.
2. ~~Periodic special inspection is required during the~~ Anchorage of other electrical equipment in structures assigned to *Seismic Design Category* E or F.
3. ~~Periodic special inspection is required during the~~ Installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to *Seismic Design Category* C, D, E or F.
4. ~~Periodic special inspection is required during the~~ Installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to *Seismic Design Category* C, D, E or F.
5. ~~Periodic special inspection is required during the~~ Installation and anchorage of vibration isolation systems in structures assigned to *Seismic Design Category* C, D, E or F where the *construction documents* require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

Reason: The purpose for the proposal is to delete superfluous language.

Cost Impact: The code change proposal will not increase the cost of construction.

S162-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11.5-S-BRAZIL.doc

S163–12
1705.11.5

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1705.11.5 Architectural components. Periodic *special inspection* is required during the erection and fastening of exterior cladding, interior and exterior nonbearing walls, suspended ceiling systems including their anchorage and interior and exterior veneer in structures assigned to *Seismic Design Category* D, E or F.

Exceptions:

1. *Special inspection* is not required for exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet (9144 mm) or less in height above grade or walking surface.
2. *Special inspection* is not required for exterior cladding and interior and exterior veneer weighing 5 psf (24.5 N/m^2) or less.
3. *Special inspection* is not required for interior nonbearing walls weighing 15 psf (73.5 N/m^2) or less.

Reason: This proposal restores the needed special inspection for suspended ceiling systems. The 2009 IBC identified "suspended ceiling systems and their anchorage" as components that needed to be included in the statement of special inspections for Seismic Design Category D, E or F, but did not list them in the section that invoked the actual inspection. Then, as part of the reorganization of Chapter 17 approved in the previous code change cycle, the requirement was deleted completely when the inspection requirements were combined with the requirements for inclusion in the statement of special inspections.

Suspended ceiling systems, when not properly anchored and braced, are well known to fail under strong shaking, resulting in debris that can block exits or otherwise impede egress from buildings.

Cost Impact: The code change proposal will increase the cost of construction.

S163-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11.5-S-KERR.doc

S164–12
1705.11.7

Proponent: Victor D. Azzi, PE, Consulting Structural Engineer, representing the Rack Manufacturers Institute (victorazzi@comcast.net)

Revise as follows:

1705.11.7 <u>Steel</u> storage racks. Periodic *special inspection* is required ~~during the anchorage~~ <u>for anchor bolt installation</u> of <u>steel</u> storage racks <u>that are designed in accordance with Section 2209, are</u> 8 feet (2438 mm) or greater in height and are in structures assigned to *Seismic Design Category* D, E or F.

Reason: Additional language ties section back to IBC Section 2209 on steel storage racks, which adopts the RMI MH 16.1 standard, and requires special inspection for the installation of anchor bolts.

Cost Impact: The code change proposal will not increase the cost of construction.

S164-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11.7-S-AZZI.doc

S165–12
1705.11.9 (NEW)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Add new text as follows:

1705.11.9 Cold-formed steel special bolted moment frames. Periodic special inspection shall be provided for the installation of cold-formed steel special bolted moment frames in the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* D, E or F.

Reason: The purpose for this proposal is to require special inspections for the installation of cold-formed steel special bolted moment frames, which are a new type of seismic force-resisting system and are listed in Table 12.2-1 of ASCE 7-10 in the category of moment-resisting frame systems (Item C.12). Their structural design is sufficiently complex to warrant inspection from a person with the expertise of a special inspector who is approved by the building official as having the competence necessary to inspect the installation of the joists. Refer to the definitions of "special inspection" and "special inspector" for further information. Examples of the complexity of the structural design that warrant special inspection of the installation are the beam-to-column connections and the anchorage to the foundation.

The standard for Seismic Design of Cold-formed Steel Structural Systems: Special Bolted Moment Frames with Supplement No. 1, AISI S110-07/S1-09, contain provisions for inspections but these are limited to quality control by the fabricator and inspections by qualified inspectors representing the owner. Refer to Section E of the standard.

Cost Impact: The code change proposal will increase the cost of construction.

S165-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11.9 (NEW)-S-BRAZIL.doc

S166–12

1705.11, 1705.11.1, 1705.11.2, 1705.11.3, 1705.11.4, 1705.11.8

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

1705.11 Special inspections for seismic resistance. *Special inspections* ~~itemized~~ for seismic resistance shall be required as specified in Sections 1705.11.1 through 1705.11.8, unless exempted by the exceptions of Section 1704.2~~, are required for the following:~~

1. ~~The seismic force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F in accordance with Sections 1705.11.1 through 1705.11.3, as applicable.~~
2. ~~Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F in accordance with Section 1705.11.4.~~
3. ~~Architectural, mechanical and electrical components in accordance with Sections 1705.11.5 and 1705.11.6.~~
4. ~~Storage racks in structures assigned to *Seismic Design Category* D, E or F in accordance with Section 1705.11.7.~~
5. ~~Seismic isolation systems in accordance with Section 1705.11.8~~.

Exception: The special inspections ~~itemized~~ specified in Sections 1705.11.1 through 1705.11.8 are not required for structures designed and constructed in accordance with one of the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 35 feet (10 668 mm).
2. The seismic force-resisting system of the structure consists of reinforced masonry or reinforced concrete; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 25 feet (7620 mm).
3. The structure is a detached one- or two-family dwelling not exceeding two *stories above grade plane* and does not have any of the following horizontal or vertical irregularities in accordance with Section 12.3 of ASCE 7:
   3.1. Torsional or extreme torsional irregularity.
   3.2. Nonparallel systems irregularity.
   3.3. Stiffness-soft story or stiffness-extreme soft story irregularity.
   3.4. Discontinuity in lateral strength-weak story irregularity.

1705.11.1 Structural steel. *Special inspection* for structural steel in the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

Exception: *Special inspections* of structural steel are not required in the *seismic force-resisting systems* of structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.11.2 Structural wood. For the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* C, D, E or F:

1. Continuous special inspection shall be required during field gluing operations of elements of the seismic force-resisting system and

2. Periodic special inspection shall be required for nailing, bolting, anchoring and other fastening of components within the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

Exception: *Special inspection* is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the seismic force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11.3 Cold-formed steel light-frame construction. For the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* C, D, E or F, periodic special inspection shall be required:

1. ~~Periodic special inspection is required~~ During welding operations of elements of the seismic force-resisting system and
2. ~~Periodic special inspection is required~~ For screw attachment, bolting, anchoring and other fastening of components within the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.

1705.11.4 Designated seismic systems. For structures assigned to *seismic Design Category* C, D, E or F, the special inspector shall examine designated seismic systems requiring seismic qualification in accordance with Section 1705.12.3 and verify that the *label*, anchorage or mounting conforms to the *certificate of compliance*.

1705.11.8 Seismic isolation systems. Periodic special inspection shall be provided for seismic isolation systems in seismically isolated structures assigned to *Seismic Design Category* B, C, D, E or F during the fabrication and installation of isolator units and energy dissipation devices.

Reason:
This proposal is the result of collaboration with the steel industry and makes changes to Section 1705.11 similar to the changes made to Section 1705.12 in a separate proposal.
As in Section 1705.12, determining applicable requirements in Section 1705.11 necessitates combining the governing item in Section 1705.11 with the corresponding subsection that follows. This exercise would be useful if it avoided duplication of the language in several of the subsections and this currently occurs for four sections (Sections 1705.11.1, 1705.11.2, 1705.11.3 and 1705.11.4). Because of the collaboration with the steel industry, however, it will now occur in only three sections and, with that, has outlived its usefulness. Any advantage gained is more than offset by the disadvantage in combining the applicable provisions, which can lead to errors by readers of the code. The proposal simplifies the requirements by transferring the language from the items in Section 1705.11 to the applicable subsections where comprehensive provisions are specified for each instance of required special inspections. Changes to Sections 1705.11.5, 1705.11.5.1, 1705.11.6 and 1705.11.7 are not made because none are needed in that the applicable provisions are already present.
Note that a separate proposal revises Section 1705.11.1 for consistency with the scope of AISC 341-10.

Cost Impact: The code change proposal will not increase the cost of construction.

S166-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.11-S-BRAZIL.doc

S167–12
1705.12.1, 1705.3.1, 1705.3.2 (NEW)

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

~~1705.12.1~~ 1705.2.2.1.3 Weldability of concrete reinforcement. ~~Where reinforcement complying with ASTM A 615 is used to resist earthquake induced flexural and axial forces in special moment frames, special structural walls and coupling beams connecting special structural walls, in structures assigned to *Seismic Design Category* B, C, D, E or F, the reinforcement shall comply with Section 21.1.5.2 of ACI 318. Certified mill test reports shall be provided for each shipment of such reinforcement~~. Where concrete reinforcement complying with a standard other than ASTM A ~~615~~ 706 is to be welded and reports of material properties verifying compliance with AWS D1.4 for weldability as specified in Section 3.5.2 of ACI 318 are not available, chemical tests shall be performed to determine weldability ~~in accordance with Section 3.5.2 of ACI 318~~.

1705.3.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. ~~Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 3.5.2 of ACI 318.~~

1705.3.2 Weldability. Weldability of reinforcement complying with a standard other than ASTM A 706, shall be verified in accordance with Section 3.5.2 of ACI 318.

Reason: The proposal retains the requirement in the last sentence of Section 1705.12.1 for chemical tests to determine weldability for concrete reinforcement complying with ASTM A 615 that is to be welded but:

1. Limits its scope to when reports of material properties verifying compliance with AWS D1.4 for weldability are not available for consistency with the referenced section of ACI 318-11 (Section 3.5.2);
2. Expands the scope to reinforcement designed to resist all load effects, not merely seismic load effects; and
3. Expands the scope to reinforcement complying with standards other that ASTM A 706 for consistency with AWS D1.4 (Section 1.3.4 in the 1998 edition) and well as the referenced section of ACI 318-11.

Cost Impact: The code change proposal will not increase the cost of construction.

S167-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.12.1-S-BRAZIL.doc

S168–12
1705.12.3, Chapter 35 (NEW)

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Air-Conditioning, Heating & Refrigeration Institute (pmclaugma@aol.com)

Revise as follows:

1705.12.3 Seismic certification of nonstructural components. The *registered design professional* shall specify on the construction documents the requirements for certification by analysis, testing or experience data, or certification by compliance with AHRI 1270 (IP)/1271 (SI) for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1705.12.

Add new standard Chapter 35 as follows:

AHRI

1270 (I-P)/1271 (SI)-2011 Requirements For Seismic Qualification of HVACR Equipment

Reason: The proposal recognizes compliance with AHRI 1270 (IP)/1271 (SI) Requirements for Seismic Qualification of HVACR Equipment, as a means to confirm seismic qualification of mechanical HVACR equipment. AHRI 1270/1271 was developed to show compliance with both ASCE 7 and IBC seismic requirements. It describes methods for equipment qualification and a process to determine equipment seismic capacity. The standard is available for review and use on AHRI's web site for free download at: http://www.ahrinet.org/search+standards.aspx.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S168-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.12.3-S-MCLAUGHLIN.doc

S169–12
1705.12, 1705.12.1, 1705.12.2, 1705.12.3, 1705.12.4

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee (pbrazil@reidmiddleton.com)

Revise as follows:

1705.12 Testing and qualification for seismic resistance. ~~The~~ Testing and qualification for seismic resistance shall be required as specified in Sections 1705.12.1 through 1705.12.4, unless exempted from *special inspections* by the exceptions of Section 1704.2. ~~are required as follows:~~

1. ~~The seismic force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F shall meet the requirements of Sections 1705.12.1 and 1705.12.2, as applicable.~~
2. ~~Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F and subject to the certification requirements of ASCE 7 Section 13.2.2 shall comply with Section 1705.12.3.~~
3. ~~Architectural, mechanical and electrical components in structures assigned to *Seismic Design Category* C, D, E or F and where the requirements of ASCE 7 Section 13.2.1 are met by submittal of manufacturer's certification, in accordance with Item 2 therein, shall comply with Section 1705.12.3.~~
4. ~~The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1705.12.4~~.

1705.12.1 Concrete reinforcement. In the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* B, C, D, E or F, where reinforcement complying with ASTM A 615 is used to resist earthquake-induced flexural and axial forces in special moment frames, special structural walls ~~and~~ or coupling beams connecting special structural walls, ~~in structures assigned to *Seismic Design Category* B, C, D, E or F,~~ the reinforcement shall comply with Section 21.1.5.2 of ACI 318. Certified mill test reports shall be ~~provided for each shipment of such reinforcement~~ submitted to the *building official*. Where reinforcement complying with ASTM A 615 is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.

1705.12.2 Structural steel. Testing ~~for~~ of structural steel in the *seismic force-resisting systems* of *structures* assigned to *Seismic Design Category* C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

> **Exception:** Testing for structural steel is not required in the *seismic force-resisting systems* of structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.12.3 Seismic certification of nonstructural components. For *structures* assigned to *Seismic Design Category* C, D, E or F, **t**he *registered design professional* shall specify on the construction documents the requirements for certification by analysis, testing or experience data for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1705.12.

1705.12.4 Seismic isolation systems. Seismic isolation systems in seismically isolated structures assigned to *Seismic Design Category* B, C, D, E or F shall be tested in accordance with Section 17.8 of ASCE 7.

Reason: Determining applicable requirements in Section 1705.12 necessitates combining the governing item in Section 1705.12 with the corresponding subsection that follows. This exercise would be useful if it avoided duplication of the language in the items in several of the subsections but this only occurs once (Sections 1705.12.1 and 1705.12.2). Any advantage gained is more than offset by the disadvantage in combining the applicable provisions, which can lead to errors by readers of the code. Also, the applicability of Section 1705.12.1 to Seismic Design Category B conflicts with corresponding Item 1 of Section 1705.12, which is limited to Seismic Design Categories C, D, E and F. The proposal simplifies the requirements by transferring the language from the items in Section 1705.12 to each of the subsections where comprehensive provisions are specified for each instance of required testing.

In Section 1705.12.1, the language requiring certified mill test reports “be provided for each shipment of such reinforcement” is replaced with “be submitted to the building official” because the details of providing the reports are not relevant to the provisions of the building code but submittal to the building official is relevant and critical to verifying that the reinforcement meets the applicable requirements in Section 21.1.5.2 of ACI 318-11.

The source document for some of the language in Section 1705.12 is the *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (Sections 3.2 and 3.4 of FEMA 368, and Sections 2.2 and 2.4 of FEMA 450-1).

Note that separate proposals:

1. Delete “qualification” in Section 1705.12 and place the provisions of Section 1705.12.3 into two subsections to provide effective charging language for the corresponding provisions in ASCE 7-10 ;
2. Transfer the requirements of Section 1705.12.1 to a new section on submittals to the building official ; and
3. Revise Section 1705.12.2 for consistency with the scope of AISC 341-10.

Cost Impact: The code change proposal will not increase the cost of construction.

S169-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1705.12-S-BRAZIL.doc

S170–12
1708.1, 1710.1

Proponent: D. Kirk Harman, The Harman Group, representing the National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee.

Revise as follows:

~~SECTION 1708~~
~~TEST SAFE LOAD~~

~~**1708.1 Where required.** Where proposed construction is not capable of being designed by *approved* engineering analysis, or where proposed construction design method does not comply with the applicable material design standard, the system of construction or the structural unit and the connections shall be subjected to the tests prescribed in Section 1710. The *building official* shall accept certified reports of such tests conducted by an *approved* testing agency, provided that such tests meet the requirements of this code and *approved* procedures.~~

(Renumber subsequent sections)

~~**1710.1 General.** In evaluating the physical properties of materials and methods of construction that are not capable of being designed by *approved* engineering analysis or do not comply with the applicable referenced standards, the structural adequacy shall be predetermined based on the load test criteria established in this section.~~

1710.1 General. Where proposed construction is not capable of being designed by *approved* engineering analysis, or where proposed construction design method does not comply with the applicable material design standard, the system of construction or the structural unit and the connections shall be subjected to the tests prescribed in Section 1710. The *building official* shall accept certified reports of such tests conducted by an *approved* testing agency, provided that such tests meet the requirements of this code and *approved* procedures.

Reason: Section 1708 is entirely comprised of section 1708.1. Section 1708.1 references section 1710. Therefore, for clarity, the text of section 1708 should be relocated to section 1710. Furthermore, section 1708.1 essentially restates the text of section 1710.1, but in greater detail. Therefore, current section 1710.1 should be deleted after the substitution as it is redundant.

Cost Impact: The code change proposal will not increase the cost of construction.

S170-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1708-S-HARMAN.doc

S171–12
1709.3.2

Proponent: Gary R. Searer, Wiss, Janey, Elstner Associates Inc., representing self

Revise as follows:

1709.3.2 Load test procedure not specified. In the absence of applicable load test procedures contained within a standard referenced by this code or acceptance criteria for a specific material or method of construction, such *existing structure* shall be subjected to a test procedure developed by a *registered design professional* that simulates applicable loading and deformation conditions. For components that are not a part of the seismic load-resisting system, the test load shall be equal ~~to two times the unfactored design loads~~ to the minimum of the specified factored design loads. For statically loaded components, the test load shall be left in place for a period of 24 hours. For components such as machine supports or fall arrest anchors that carry dynamic loads, the load shall be left in place for a period consistent with the component's actual function. The structure shall be considered to have successfully met the test requirements where the following criteria are satisfied:

1. Under the design load, the deflection shall not exceed the limitations specified in Section 1604.3.
2. Within 24 hours after removal of the test load, the structure shall have recovered not less than 75 percent of the maximum deflection.
3. During and immediately after the test, the structure shall not show evidence of failure.

Reason: This code change proposal does two things: 1) changes the required static test load from *precisely* "two times the unfactored design load" to a "minimum of the specified factored design loads", and 2) specifies how to test components that carry dynamic loads.

It is essentially not possible for the test load to be precisely two times any particular load, and the requirement to test to two times the unfactored load is arbitrary (i.e., why should you test to 2.0D+2.0L if the commonly accepted and statistically based load combination is 1.2D+1.6L?). By adding the phrase "a minimum of" to the requirement and by referencing factored loads, the intent of the provision is made clear -- that the test load should be *at least* the specified factored design load. Nationally recognized design standards such as the AISC Steel Specifications and ACI 318 have been developed with the intent to ensure that very few elements are unable to carry factored loads. To put it another way, if every element in a structure could carry factored loads, the structure's reliability would be consistent with the intent of such standards. In fact, the load testing provisions in each of the AISC and ACI standards make this clear by requiring proof test loads to essentially the full factored loads. This proposal is in-line with both AISC and ACI standards.

When an element is designed to carry short duration or dynamic loads, there is no need to sustain a proof test load for 24 hours.

Cost Impact: The code change proposal will not increase the cost of construction.

S171-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1714.3.2-S-SEARER.doc

S172–12
1710.5

Proponent: Julie Ruth, P.E. JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA) (julruth@aol.com)

Revise as follows:

1710.5 Exterior window and door assemblies. The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1710.5.1 or 1710.5.2.

> **Exception:** Structural wind load design pressures for window units ~~smaller~~ other than the size tested in accordance with Section 1710.5.1 or 1710.5.2 shall be permitted to be ~~higher~~ different than the design value of the tested unit provided such ~~higher~~ pressures are determined by accepted engineering analysis or validated by an additional test of the window unit to the alternate allowable design pressure in accordance with Section 1710.5.2. All components of the ~~small~~ alternate size unit shall be the same as the tested or labeled unit. Where ~~such calculated design pressures are~~ engineering analysis is used, ~~they shall be validated by an additional test of the window unit having the highest allowable design pressure~~ the glass shall comply with Section 2403.

Reason: The current exception limits the use of comparative analysis to window units smaller than the size originally tested for labeling purposes. If comparative analysis is used to provide a higher design pressure rating of the smaller unit, its resistance to air infiltration and water penetration at the correspondingly higher design pressure required by AAMA/WDMA/CSA 101/I.S.2/A440 must be verified by testing of the unit. These characteristics cannot be determined by calculation.

Comparative analysis is also appropriate to rate window units larger than the size originally tested for labeling purposes to lower design pressures. In this scenario, the corresponding design pressure used to verify resistance to air infiltration and water penetration would also be lower. Testing would not be required to verify this level of performance since a higher level has already been determined by testing of the same components in a smaller window unit.

This proposal revises this section as appropriate to permit the use of comparative analysis for larger as well as smaller window units than those tested for labeling. The last sentence of the section is also revised to specify that when engineering analysis is used, the glass in the fenestration product must also comply with Section 2403. Section 2403 establishes specific criteria for the deflection of the framing supporting the glass.

Cost Impact: The code change proposal will not increase the cost of construction.

S172-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1710.5 #1-S-RUTH

S173–12
1710.5

Proponent: Julie Ruth, P.E., JRuth Code Consulting, representing American Architectural Manufacturers (AAMA) and Joseph R. Hetzel, P.E., Thomas Associates, Inc., representing Door & Access Systems Manufacturers Association (DASMA) International

Revise as follows:

1710.5 Exterior window and door assemblies. The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1710.5.1 or 1710.5.2. For the purposes of this section, the required design pressure shall be determined using the allowable stress design load combinations of Section 1605.3.

> **Exception:** Structural wind load design pressures for window units smaller than the size tested in accordance with Section 1710.5.1 or 1710.5.2 shall be permitted to be higher than the design value of the tested unit provided such higher pressures are determined by accepted engineering analysis. All components of the small unit shall be the same as the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window unit having the highest allowable design pressure.

Reason: The standards referenced in Section 1710.5 are based upon allowable stress design. This includes AAMA/WDMA/CSA 101/I.S.2/440, ASTM E330 and ANSI/DASMA 108. This proposal adds a sentence to the beginning of the section that clarifies that ASD loads are to be used in the application of this section.

Cost Impact: The code change proposal will not increase the cost of construction.

S173-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1710.5 #2-S-RUTH

S174–12
1710.5.1, 1710.5.2

Proponent: Julie Ruth, P.E., JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA) (julruth@aol.com)

Revise as follows:

1710.5.1 Exterior windows and doors. Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440. The *label* shall state the name of the manufacturer, the *approved* labeling agency and the product designation as specified in AAMA/ DMA/CSA101/I.S.2/A440. ~~Exterior side hinged doors shall be tested and *labeled* as conforming to AAMA/WDMA/CSA101/I.S.2/A440 or comply with Section 1710.5.2.~~ Products tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3.

1710.5.2 Exterior windows and door assemblies not provided for in Section 1710.5.1. Exterior window and door assemblies shall be tested in accordance with ASTM E 330 except that the structural performance of garage doors and rolling doors shall be determined in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the acceptance criteria of ANSI/DASMA 108. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure.

Reason: At the present time exterior windows and sliding doors are required to be tested and labeled in accordance with AAMA/WDMA/CSA 101/I.S.2/A440. While this specification does require the fenestration product to be tested for resistance to structural load in accordance with ASTM E330, it also requires a number of other tests to be performed. These include resistance to air leakage and water penetration. Other tests such as forced entry resistance may be required depending upon the operator type of the product.

The integrity of the building envelope is dependent upon the performance of the fenestration in the envelope. This is as true for swinging doors as it is for sliding doors and windows. Previous attempts to extend the AAMA/WDMA/CSA 101/I.S.2/A440 labeling requirement to swinging doors were met with resistance. But to date, no acceptable alternative method of determining adequate performance of these products has been provided.

Products that are labeled in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 are now available on the marketplace. Its time to tighten up this important component of the building envelope and require swinging doors to provide the same level of protection to the interior of the building that other components of the building envelope are required to provide.

Cost Impact: There will be no cost increase for products that are already being tested in compliance with Section 1710.5, as required by the IBC.

S174-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1710.5.1 #1-S-RUTH.doc

S175 – 12
1710.5.1

Proponent: Thomas S. Zaremba, Roetzel & Associates, representing Glazing Industry Code Committee (tzaremba@ralaw.com)

Revise as follows:

1710.5.1 Exterior windows and doors. Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440. The *label* shall state the name of the manufacturer, the *approved* labeling agency and the product designation as specified in AAMA/ WDMA/CSA101/I.S.2/A440. Exterior side-hinged doors shall be tested and *labeled* as conforming to AAMA/WDMA/CSA101/I.S.2/A440 or comply with Section 1710.5.2. Products <u>in Risk Category I and II buildings</u> tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3 <u>provided one of the following is met:</u>

1. <u>The required design pressure for the fenestration product does not exceed 60 psf or</u>
2. <u>All glass in the fenestration product is tempered or laminated.</u>

Reason: Chapter 24 and ASTM E1300 require that glazing be firmly supported to prevent breakage under the design load by establishing maximum framing deflection limits. The glass strength calculations in ASTM E1300 use this as a basis to establish a probability of glass breakage less than 8 in 1000. However, Section 1710.5.1 currently exempts certain residential and light commercial products from this requirement if they are labeled to the AAMA/WDMA/CSA 101/I.S.2/A440 standard. While this may be appropriate when these products are used in applications with lower design loads and/or lower risk building types, allowing this exception for *all* product types in *all* occupancies is far too broad. This proposal would correct this overbreadth by ensuring that products used in higher risk situations be firmly supported and meet the frame deflection limit to restore an appropriate safety margin consistent with ASTM E1300.

Specifically, this proposal would limit the exception to only risk category I and II buildings, and products used in higher risk category buildings must meet the Chapter 24 requirement for firmly supported glazing. This includes hospitals, public assembly areas with over 300 people, schools (often used as storm shelters), mission-critical facilities, and infrastructure. To provide flexibility, the proposal also maintains the exception for lower design pressures less than 60 psf, and where tempered or laminated glass is used as an alternative method to reduce the probability of glass breakage and/or potential risk of falling glass.

This proposal is significantly different than other proposals discussed in previous cycles, which would have removed the exception for all buildings other than lowrise residential. This proposal takes a much more moderate approach to restore the appropriate safety margin consistent with Chapter 24 and ASTM E1300 in higher risk situations, but leave the exception and flexibility for residential and light commercial products in lower risk applications.

Cost Impact: The code change proposal will not increase the cost of construction.

S175-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1710.5.1-S-ZAREMBA.doc

S176–12
202, 1710.6, 2404.2, 2405.5, 2405.5.1, 2405.5.2

Proponent: Julie Ruth, P.E., JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA) (julruth@aol.com)

Revise as follows:

SECTION 202
DEFINITIONS

SKYLIGHTS AND SLOPED GLAZING. Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing material in skylights, including *unit skylights*, *tubular daylighting devices,* solariums, *sunrooms*, roofs and sloped walls, are included in this definition.

Revise as follows:

1710.6 Skylights and sloped glazing. ~~Unit skylights and tubular daylighting devices (TDDs) shall comply with the requirements of Section 2405. All other~~ Skylights and sloped glazing shall comply with the requirements of Chapter 24.

Revise as follows:

2404.2 Sloped glass. Glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunrooms, sloped roofs and other exterior applications shall be designed to resist the most critical of the following combinations of loads.

> **Exception:** The design pressure rating of unit skylights and tubular daylighting devices shall be ~~designed~~ determined in accordance with Section 2405.5.

(Portions of section not shown remain unchanged)

2405.5 Unit skylights and tubular daylighting devices. Unit skylights and tubular devices shall be tested and labeled as complying with AAMA/WDMA/CSA 101/I.S./A440. The *label* shall state the name of the manufacturer, the *approved* labeling agency, the product designation and the performance grade rating as specified in AAMA/WDMA/CSA 101/I.S.2/A440. If the product manufacturer has chosen to have the performance grade of the skylight rated separately for positive and negative design pressure, then the *label* shall state both performance grade ratings as specified in AAMA/ WDMA/CSA 101/I.S.2/A440 and the skylight shall comply with Section 2405.5.2. If the skylight is not rated separately for positive and negative pressure, then the performance grade rating shown on the *label* shall be the performance grade rating determined in accordance with AAMA/WDMA/ CSA 101/I.S.2/A440 for both positive and negative design pressure and the skylight shall conform to Section 2405.5.1.

2405.5.1 ~~Unit~~ Skylights rated for the same performance grade for both positive and negative design pressure. The design of ~~unit~~ skylights shall be based on the following equation:

$F_g \leq PG$ **(Equation 24-13)**

where:

F_g = Maximum load on the skylight determined from Equations 24-2 through 24-4 in Section 2404.2.
PG = Performance grade rating of the skylight.

2405.5.2 ~~Unit~~ Skylights rated for separate performance grades for positive and negative design pressure. The design of ~~unit~~ skylights rated for performance grade for both positive and negative design pressures shall be based on the following equations:

$F_{gi} \le PG_{Po}$ **(Equation 24-14)**
$F_{go} \le PG_{Ne}$ **(Equation 24-15)**

where:

PG_{Pos} = Performance grade rating of the skylight under positive design pressure;
PG_{Neg} = Performance grade rating of the skylight under negative design pressure; and
F_{gi} and F_{go} are determined in accordance with the following:

For $W_o \ge D$,

where:

W_o = Outward wind force, psf (kN/m^2) as calculated in Section 1609.
D = The dead weight of the glazing, psf (kN/m^2) as determined in Section 2404.2 for glass, or by the weight of the plastic, psf (kN/m^2) for plastic glazing.
F_{gi} = Maximum load on the skylight determined from Equations 24-3 and 24-4 in Section 2404.2.
F_{go}= Maximum load on the skylight determined from Equation 24-2.

For $W_o < D$,

where:

W_o = Is the outward wind force, psf (kN/m^2) as calculated in Section 1609.
D = The dead weight of the glazing, psf (kN/m^2) as determined in Section 2404.2 for glass, or by the weight of the plastic for plastic glazing.
F_{gi} = Maximum load on the skylight determined from Equations 24-2 through 24-4 in Section 2404.2.
F_{go}= 0.

Reason: The overall intent of this proposal is to clarify the requirements for tubular daylighting devices, within the context of skylights and sloped glazing in the IBC.

Tubular daylighting devices are a type of skylights, just as unit skylights are. The 2012 IBC contains a definition of TDDs that is consistent with the 2012 IRC. Part I of this proposal simply clarifies that, like unit skylights, TDDs are a type of skylight. This change would also bring consistency to the definition of skylights and sloped glazing between the IRC and IBC.

Section 1710.6 was intended to point the code user to the structural testing provisions of Chapter 24 for skylights and sloped glazing. As currently written, however, it may be misinterpreted as only requiring unit skylights and TDDs to comply with Section 2405.5, and not Chapter 24 in its entirety. This is not correct. The removal of a separate reference for unit skylights and TDDs will help to clarify this.

As currently written, the exception to Section 2404.2 may be interpreted as only requiring unit skylights and TDDs to meet Section 2405.5. This is not the intent of this exception. The proposed revision clarifies that only the design pressure rating of unit skylights and TDDs is to be determined in accordance with Section 2405.5. These products must still meet the other requirements of Chapter 24, and specifically of Section 2405.

Section 2405.5 is revised to clarify that both unit skylights and TDDs are to be tested and labeled in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

Cost Impact: The code change proposal will not increase the cost of construction.

S176-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1710.6-S-RUTH.doc

S177–12
1711.1, 2303.5, 2304.9.3, Chapter 35 (NEW)

Proponent: Brad Douglas, P.E., American Wood Council

Delete without substitution:

~~**1711.1 Joist hangers.** Testing of joist hangers shall be in accordance with Sections 1711.1.1 through 1711.1.3, as applicable.~~

~~**1711.1.1 General.** The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.~~

> ~~**Exception:** The joist length shall not be required to exceed 24 inches (610 mm).~~

~~**1711.1.2 Vertical load capacity for joist hangers.** The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:~~

1. ~~The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).~~
2. ~~The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).~~
3. ~~The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of $^{1}/_{8}$ inch (3.2 mm).~~
4. ~~The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.~~
5. ~~The allowable design load for the wood members forming the connection.~~

~~**1711.1.2.1 Design value modifications for joist hangers.** Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1711.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1711.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1711.1.2 shall not be modified by duration of loading factors.~~

~~**1711.1.3 Torsional moment capacity for joist hangers.** The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is $^{1}/_{8}$ inch (3.2 mm).~~

(Renumber subsequent sections)

Revise as follows:

2303.5 Test standard for joist hangers. ~~For the required test standards for joist hangers see Section 1711.1~~ Joist hangers shall conform to requirements of ASTM D 7147.

Revise as follows:

2304.9.3 Joist hangers and framing anchors. Connections depending on joist hangers or framing anchors, ties and other mechanical fastenings not otherwise covered are permitted where *approved*. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ~~Section 1711.1~~ ASTM D 7147.

Add new standard to Chapter 35 as follows:

ASTM

D 7147-05, Specification for Testing and Establishing Allowable Loads of Joist Hangers

Reason: The 2009 IBC updated the reference to ASTM D 1761 from a prior edition to a 2006 edition for the testing of joist hangers. However, ASTM D1761-06 no longer contains provisions for testing of joist hangers. These provisions were moved to and revised in ASTM D7147. The revisions included sampling and evaluation criteria (currently included in IBC section 1711.1) as well as further refinements regarding quality of test materials, adjustments for variation in test materials, and limits on design values with materials other than those tested. In addition, since ASTM D7147 is specific to joist hangers used with wood and contains provisions that go beyond testing, it is more appropriate to reference it in Chapter 23 rather than Chapter 17.

Cost Impact: The code change proposal will not increase the cost of construction.

S177-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1711.1-S-COATS.doc

S178–12
1711.1.1, 1711.1.2, 1711.1.2.1, 1711.1.3, Chapter 35 (NEW)

Proponent: Randall Shackelford, P.E., Simpson Strong-Tie Company, Inc., (rshackelford@strongtie.com)

Revise as follows:

1711.1 Joist hangers. Testing of joist hangers shall be in accordance with Sections 1711.1.1 through ~~1711.1.3~~ 1711.1.2, as applicable.

1711.1.1 ~~General~~ Allowable stress design. The allowable vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D ~~1761~~ 7147 ~~using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers~~.

~~**Exception:** The joist length shall not be required to exceed 24 inches (610 mm).~~

~~**1711.1.2 Vertical load capacity for joist hangers.** The vertical load-bearing capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load-bearing of the joist hanger shall be the lowest value determined from the following:~~

1. ~~The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).~~
2. ~~The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted). 3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 1/8 inch (3.2 mm).~~
4. ~~The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.~~
5. ~~The allowable design load for the wood members forming the connection.~~

~~**1711.1.2.1 Design value modifications for joist hangers.** Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1711.1.2 shall be permitted to be modified by the appropriate load duration factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1711.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1711.1.2 shall not be modified by load duration factors.~~

~~**1711.1.3 Torsional moment capacity for joist hangers.** The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 1/8 inch (3.2 mm).~~

(Renumber subsequent sections)

1711.1.2 LRFD or Strength Design. The resistance of joist hangers for LRFD or strength design shall be determined using an approved method.

Add new standard to Chapter 35 as follows:

ASTM

<u>D 7147—11 Standard Specification for Testing and Establishing Allowable Loads of Joist Hangers</u>

Reason: In the 2012 IBC, this section requires that the capacity of joist hangers be determined using ASTM D1761. The 2006 edition of that standard is referenced in Chapter 35. The problem is that the 2006 edition no longer contains requirements for testing of joist hangers. All joist hanger testing requirements were removed, and a new standard, ASTM D7147 was written for testing of joist hangers. The newest edition of the ASTM D7147 standard is the 2011 edition. That is being suggested as the most applicable standard for determining allowable loads for joist hangers.
The specific methods for evaluating the test data can be deleted because all those requirements are now contained in ASTM D7147, whereas they were not present in D1761.
This standard is only applicable for determining allowable stress loads. It does not give guidance for determining resistances for LRFD. There are documents that give such guidance, such as the American Wood Council *Load and Resistance Factor Design (LRFD) Manual for Engineered Wood Construction.* There is precedence for having sections for both ASD and LRFD. Sections 1908 and 1909 contain requirements for design of anchorage to concrete using allowable stress and strength design, respectively.

Cost Impact: ASTM D7147 does contain some additional requirements for testing and recording the hanger steel strength, wood specific gravity, and bending yield strength of fasteners, which could increase the cost of testing over ASTM D1761-2000, but that standard is no longer referenced anyway so that is not really an option.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S178-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1711.1-S-SHACKELFORD.doc

S179–12
1803.5.12

Proponent: Mark Petersen, The Shaw Group, Inc., representing Deep Foundations Institute, Seismic and Lateral Load Committee

Revise as follows:

1803.5.12 Seismic Design Categories D through F. For structures assigned to *Seismic Design Category* D, E or F, the geotechnical investigation required by Section 1803.5.11 shall also include all of the following as applicable:

1. The determination of dynamic seismic lateral earth pressures on foundation walls and retaining walls supporting more than 6 feet (1.83 m) of backfill height due to design earthquake ground motions.
2. The potential for liquefaction ~~and~~ , soil strength loss, post-liquefaction reconsolidation settlement, and lateral spreading deformation shall be evaluated for site peak ground acceleration, earthquake magnitude, and source characteristics consistent with the maximum considered earthquake ground motions and the design earthquake ground motions. The deformations associated with the maximum considered earthquake motions should be used to evaluate collapse of the structure. The deformations associated with the design earthquake ground motions should be used for structure design. Peak ground acceleration shall be determined based on:
   - 2.1 A site-specific study in accordance with Section 21.5 of ASCE 7 for the maximum considered earthquake ground motions, use two-thirds of the site-specific maximum considered earthquake peak ground acceleration;; or
   - 2.2 In accordance with Section 11.8.3 of ASCE 7 for the maximum considered earthquake motions and in accordance with Section 11.4.5 of ASCE 7 for the design earthquake motions.
3. An assessment of potential consequences of liquefaction and soil strength loss, including, but not limited to:
   - 3.1. Estimation of total and differential settlement;
   - 3.2. Lateral soil movement;
   - 3.3. Lateral soil loads on foundations;
   - 3.4. Reduction in foundation soil-bearing capacity and lateral soil reaction;
   - 3.5. Soil downdrag and reduction in axial and lateral soil reaction for pile foundations;
   - 3.6. Increases in soil lateral pressures on retaining walls; and
   - 3.7. Flotation of buried structures.
4. Discussion of mitigation measures such as, but not limited to:
   - 4.1. Selection of appropriate foundation type and depths;
   - 4.2. Selection of appropriate structural systems to accommodate anticipated displacements and forces;
   - 4.3. Ground stabilization; or
   - 4.4. Any combination of these measures and how they shall be considered in the design of the structure.

Reason: buildings designed to ASCE 7-05 seismic provisions are expected to resist collapse during an MCE event, and therefore the possible effects of liquefaction on the stability of the foundation and structure require evaluation at this level." (C.B. Crouse, M.S. Power, and D.G. Anderson, "New Liquefaction Requirements and Associated Peak Ground Acceleration Maps", 2010 Structures Congress, ASCE.

The proposed change is consistent with the code philosophy. That is, collapse is evaluated based on liquefaction-induced deformations resulting from the maximum considered earthquake motions and design is based on the liquefaction-induced deformations resulting from the design earthquake ground motions.

Cost Impact: The code change proposal will not increase the cost of construction.

S179-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1803.5.12-S-PETERSEN.doc

S180–12
1803.5.6

Proponent: Theodore L Droessler, Clark County Nevada, representing Clark County Development Services, and R. David Charles, P.E., representing ASFE, the Geoprofessional Business Association.

Revise as follows:

1803.5.6 Rock strata. Where subsurface explorations at the project site indicate ~~variations or doubtful characteristics in the structure of~~ the presence of rock upon which foundations are to be constructed, a sufficient number of borings shall be made to a depth of not less than 10 feet (3048 mm) below the level of the foundations ~~to provide assurance of the soundness of the foundation bed~~ assess the competency of the rock and its load-bearing capacity in terms of the rock strength and the presence, orientation, and condition of discontinuities, weathering profiles and other similar profiles of the sampled rock as they apply at a particular site.

Reason: The proposed modification is intended to make the wording of the Code addressing the evaluation of rock materials for foundation support more consistent with current geotechnical engineering practice.

The current wording suggests that it is possible to provide “assurance of the soundness of rock” during the geotechnical evaluation phase. Unfortunately, experience has shown that even at sites where rigorous evaluation of rock conditions is undertaken, it is often determined during construction that rock conditions between the locations sampled can vary significantly. Many times the actual rock conditions at foundation locations are exposed or better defined (through excavation, proof-drilling, etc.) during construction, and interpretations of the conditions exposed during the construction process are necessary to complete the design of the foundation element.

The proposed modifications to Section 1803.5.6 express the characteristics necessary to assess the rock strata and estimate a load-bearing capacity based on observations and testing.

Cost Impact: The code change proposal will not increase the cost of construction.

S180-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1803.5.6-S-CHARLES-DROESSLER.doc

S181–12
1803.5.7, 1804.1, 1804.2 (NEW), 1804.2.1 (NEW),

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

1803.5.7 Excavation near foundations. Where excavation will remove ~~lateral~~ support from any foundation~~, an investigation shall be conducted to assess the potential consequences and address mitigation measures~~ a Registered Design Professional shall prepare a report summarizing the condition of the structure as determined from examination of the structure, the review of available design documents and if necessary, the excavation of test pits. The Registered Design Professional shall determine the requirements for underpinning and protection and prepare site-specific plans, details, and sequence of work for submission. Such support may be provided by underpinning, sheeting, and bracing, or by other means acceptable to the building official.

1804.1 Excavation near foundations. Excavation for any purpose shall not remove lateral support from any foundation or adjacent foundation without first underpinning or protecting the foundation against settlement or lateral translation.

1804.2 Underpinning. Where the protection and/or support of adjacent structures is required, the underpinning system shall be designed and installed in accordance with provisions of this chapter and Chapter 33.

1804.2.1 Underpinning and bracing installation. Where underpinning is used for the support of adjacent structures, the piers, wall piles or footings shall be installed in such manner so as to prevent the lateral or vertical displacement of the adjacent structure, to prevent deterioration of the foundations or other effects that would disrupt the adjacent structure. The sequence of installation shall be identified in the design.

Reason: At present, excavation of foundations is not specifically addressed in relation to adjacent structures. Section 3307, Protection of Adjacent Property, states: “Adjoining public and private property shall be protected from damage during construction, remodeling and demolition work. Protection shall be provided for footings, foundations, party walls, chimneys, skylights and roofs.”

The code currently has minimal and vague requirements of the due diligence required for investigation for excavation near a neighboring structure. Failures to perform proper pre-construction investigations and monitoring procedures have led to failures in construction during underpinning and excavation operations. Improper excavations result nationally in doors and windows that don’t open, increasing through cracking of bearing walls and support members, failures of structural members and to collapse and fatalities.

Specific guidelines are provided to identify responsibilities and basic requirements for providing safe and successful underpinning and excavations.

Cost Impact: The code change proposal will not increase the cost of construction.

S181-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1803.5.7-S-HUSTON.doc

S182–12
1806.2

Proponent: Theodore L Droessler, Clark County Nevada, representing Clark County Development Services, R. David Charles, P.E., representing ASFE, the Geoprofessional Business Association.

Revise as follows:

1806.2 Presumptive load-bearing values. The load-bearing values used in design for supporting soils near the surface shall not exceed the values specified in Table 1806.2 unless data to substantiate the use of higher values are submitted and *approved*. Where the *building official* has reason to doubt the classification, strength ~~or compressibility~~ of the soil, <u>or in cases where settlement and/or differential settlement of the foundations is a concern for the serviceability or stability of the structure,</u> the requirements of Section 1803.5.2 shall be satisfied. Presumptive load-bearing values shall apply to materials with similar physical characteristics and dispositions. Mud, organic silt, organic clays, peat or unprepared fill shall not be assumed to have a presumptive load-bearing capacity unless data to substantiate the use of such a value are submitted.

> **Exception:** A presumptive load-bearing capacity shall be permitted to be used where the *building official* deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight or temporary structures.

Reason: The proposed modification is intended to clarify that the use of “presumptive load-bearing values” should be limited to certain situations, for which judgment needs to be exercised. The term compressibility is replaced with serviceability to reflect similar language used in Chapter 16 for deflection of structural members.

While there is history of using “presumptive load-bearing capacities” for lightly loaded and temporary structures in some jurisdictions, the use of such “presumptive” values to design foundations for structures, without the benefit of subsurface evaluation and geotechnical analysis, should be used with caution. In the event that total or differential settlement of a structure is of concern, a geotechnical evaluation (consistent with Section 1803.5.2) should be performed by a qualified geotechnical professional.

Cost Impact: The code change proposal will not increase the cost of construction.

S182-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1806.2-S-CHARLES-DROESSLER.doc

S183–12
1808.2

Proponent: Theodore L Droessler, Clark County Nevada, representing Clark County Development Services , R. David Charles, P.E., representing ASFE, the Geoprofessional Business Association.

Revise as follows:

1808.2 Design for capacity and settlement. Foundations shall be so designed that the allowable bearing capacity of the soil is not exceeded, and that the estimated total and differential settlement ~~is minimized~~ shall not cause harmful distortion or instability in the structure, nor cause any element to be loaded beyond its limit states or allowable capacity. Foundations in areas with expansive soils shall be designed in accordance with the provisions of Section 1808.6.

Reason: The proposed modification is intended to make the wording of the Code addressing the design of shallow foundation systems consistent with practice of the design of shallow foundation systems. The proposed change also makes the wording of the Code for shallow foundations consistent with the existing wording of the Code for deep foundation systems.

The existing wording of the Code states that shallow foundation systems are to be designed such that "differential settlement is minimized." In many cases, several shallow foundation options are identified as feasible during the geotechnical evaluation for a given structure, with different degrees of potential differential settlement under different options. The final selection of the appropriate foundation option for a specific project should be made by the design team, (including the structural engineer, the geotechnical engineer and the Owner), based on consideration of cost and the implications of the estimated total and differential settlement. The option chosen for a specific project may not necessarily be the one for which "differential settlement is minimized." Therefore, rewording this section of the Code to recognize current practice is appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

S183-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1808.2-S-CHARLES-DROESSLER.doc

S184–12
1808.3.2 (NEW)

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Add new text as follows:

1808.3.2 Surcharge. No fill or other surcharge loads shall be placed adjacent to any building or structure unless such building or structure is capable of withstanding the additional loads caused by the fill or the surcharge. Existing footings or foundations which will be affected by any excavation shall be underpinned or otherwise protected against settlement and shall be protected against lateral movement.

Reason: The code does not comment on permanent loads surcharging a neighboring structure. It references surcharge loads only in reference to construction loading in Chapter 33.

Cost Impact: The code change proposal will not increase the cost of construction.

S184-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1808.3.2 (NEW)-S-HUSTON.doc

S185–12
1810.2.5

Proponent: Lori A. Simpson, P.E., GE, Treadwell & Roll, a Langan Company, representing Deep Foundations Institute

Revise as follows:

1810.2.5 Group effects. The analysis shall include group effects on lateral behavior where the center-to-center spacing of deep foundation elements in the direction of lateral force is less than eight times the least horizontal dimension of an element. The analysis shall include group effects on axial behavior where the center-to-center spacing of deep foundation elements is less than three times the least horizontal dimension of an element. Group effects shall be evaluated using an approved method of analysis; the analysis for uplift of grouped elements with center-to-center spacing less than three times the least horizontal dimension shall be evaluated in accordance with Section 1810.3.3.1.6.

Reason: To make the evaluation of group effects on uplift more clear that it needs to be performed where spacing is less than three times the least horizontal dimension. While this section may seem clear without the change, Section 1810.3.3.1.6 makes it unclear what spacing necessitates evaluation of group effects for uplift. Cross referencing the other section, plus changes made to Section 1810.3.3.1.6 (see another Code Change Proposal), will clarify this issue.

Cost Impact: The code change proposal will not increase the cost of construction.

S185-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.2.5-S-SIMPSON.doc

S186–12

1810.3.1, 1810.3.1.1, 1810.3.1.7 (NEW), 1810.3.1.8 (NEW), 1810.3.2.4, 1810.3.2.6, Table 1810.3.2.6, 1810.3.2.7, 1810.3.2.8, 1905.1.11

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1810.3.1 Design conditions. Design of deep foundations shall include the design conditions specified in Sections 1810.3.1.1 through ~~1810.3.1.6~~ 1810.3.1.8, as applicable. As an alternate, the allowable loads can be evaluated using the allowable stresses in Section 1810.3.2.6.

1810.3.1.1 Design methods for concrete elements. Where concrete deep foundations are laterally supported in accordance with Section 1810.2.1 for the entire height and applied forces cause bending moments no greater than those resulting from accidental eccentricities, structural design of the element using the load combinations of Section 1605.3 and the allowable stresses specified in this chapter shall be permitted. Otherwise, the structural design of concrete deep foundation elements shall use the load combinations of Section 1605.2 and ~~*approved* strength design methods.~~ the member design shall be in accordance with ACI 318 subject to the other requirements in this chapter.

1. Prestressed precast concrete piles may use other *approved* strength design methods.
2. Permanent casing can be used in place of confinement reinforcement for cast-in-place concrete elements not greater than 16 inches in diameter if strength and stiffness of the casing is equal or greater than that of the specified confinement reinforcing.

1810.3.1.7 Timber piles. Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS.

1810.3.1.8 Steel H Piles. Steel H-Piles in Seismic Design Categories D, E, or F shall comply with the Provisions of AISC 360 and AISC 341. In other cases the use of AISC 360 is allowed.

1810.3.2.4 Timber. ~~Timber deep foundation elements shall be designed as piles or poles in accordance with AF&PA NDS~~. Round timber elements shall conform to ASTM D 25. Sawn timber elements shall conform to DOC PS-20.

1810.3.2.6 Allowable stresses. ~~The allowable stresses for materials used in deep foundation elements shall not exceed those specified in Table 1810.3.2.6~~. Allowable stresses in Table 1810.2.6 can be used only where deep foundations are laterally supported in accordance with Section 1810.2.1 for the entire height and applied forces cause bending moments no greater than those resulting from accidental eccentricities, structural design of the element using the load combinations of Section 1605.3. Use of allowable stresses is subject to the constraints of Section 1810.3.1.

TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS[a]
1.Concrete or grout in compression[b]	
~~Cast-in-place with a permanent casing in accordance with Section 1810.3.2.7~~	~~$0.4f'_c$~~
Cast-in-place in a pipe, tube, other permanent casing or rock	$0.33f'_c$
Cast-in-place without a permanent casing	$0.3f'_c$
Precast nonprestressed	$0.33f'_c$
Precast prestressed	$0.33f'_c - 0.27f_{pc}$

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS[a]
2.Nonprestressed reinforcement in compression	$0.4f_y \leq 30{,}000$ psi
3. Structural steel in compression Cores within concrete-filled pipes or tubes ~~Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8~~ Pipes or tubes for micropiles ~~Other pipes~~Pipes, tubes or H-piles Helical piles	 $0.5\ F_y \leq 32{,}000$ psi ~~$0.5\ F_y \leq 32{,}000$ psi~~ $0.4\ F_y \leq 32{,}000$ psi $0.35\ F_y \leq 16{,}000$ psi $0.6\ F_y \leq 0.5\ F_u$
4.Nonprestressed reinforcement in tension Within micropiles Other conditions	 $0.6f_y$ $0.5f_y \leq 24{,}000$ psi
5. Structural steel in tension ~~Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8~~ ~~Other pipes~~Pipes, tubes or H-piles Helical piles	 ~~$0.5\ F_y \leq 32{,}000$ psi~~ $0.35\ F_y \leq 16{,}000$ psi $0.6\ F_y \leq 0.5\ F_u$
~~6.Timber~~	~~In accordance with the AF&PA NDS~~

For SI: 1 pound per square inch = 6.895 kPa.

a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of structural steel; F_u is the specified minimum tensile stress of structural steel.

b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered the concrete surface.

~~**1810.3.2.7 Increased allowable compressive stress for cased cast-in-place elements.** The allowable compressive stress in the concrete shall be permitted to be increased as specified in Table 1810.3.2.6 for those portions of permanently cased cast-in-place elements that satisfy all of the following conditions:~~

1. ~~The design shall not use the casing to resist any portion of the axial load imposed.~~
2. ~~The casing shall have a sealed tip and be mandrel driven.~~
3. ~~The thickness of the casing shall not be less than manufacturer's standard gage No.14 (0.068 inch) (1.75 mm).~~
4. ~~The casing shall be seamless or provided with seams of strength equal to the basic material and be of a configuration that will provide confinement to the cast-in-place concrete.~~
5. ~~The ratio of steel yield strength (*Fy*) to specified compressive strength (*f ′c*) shall not be less than six.~~
6. ~~The nominal diameter of the element shall not be greater than 16 inches (406 mm).~~

1810.3.2.7 Cased cast-in-place elements. Permanently cased ast-in-place concrete elements shall comply with the following.

1. The design shall not use the casing to resist any portion of the imposed axial load.
2. For mandrel driven piles

   a. The casing shall have a sealed tip and be mandrel driven.
   b. The thickness of the casing shall not be less than No. 14 (0.068 inch) (1.75 mm) gage.
   c. The nominal diameter of the element shall not be greater than 16 inches (406 mm).
   d. The ratio of steel yield strength (F_y) to specified compressive strength (f'_c) shall not be less than six.

3. The casing shall be seamless or provided with seams of strength equal to the basic material and be of a configuration that will provide confinement to the cast-in-place concrete.

~~**1810.3.2.8 Justification of higher allowable stresses.** Use of allowable stresses greater than those specified in Section 1810.3.2.6 shall be permitted where supporting data justifying such higher stresses is filed with the *building official*. Such substantiating data shall include:~~

1. ~~A geotechnical investigation in accordance with Section 1803; and~~
2. ~~Load tests in accordance with Section 1810.3.3.1.2, regardless of the load supported by the element.~~

~~The design and installation of the deep foundation elements shall be under the direct supervision of a *registered design professional* knowledgeable in the field of soil mechanics and deep foundations who shall submit a report to the *building official* stating that the elements as installed satisfy the design criteria.~~

Add new text as follows:

<u>**1905.1.11 ACI 318, Section 1.1.6.** Modify ACI 318 Section 1.1.6 to read as follows:</u>

<u>1.1.6 – This Code does not govern design and installation of portions of prestressed concrete piles, in ground except for structures assigned to Seismic Design Categories D, E. and F. See 21.12.4 for requirements for concrete piles, drilled piers, and caissons in structures assigned to Seismic Design Categories D, E, and F.</u>

Reason: The current code references to increased allowable stresses do not provide guidance on what the increased allowable stresses should be, with a few exceptions. The proposal resolves this ambiguity by making it clear that when higher capacities are desired or the constraints on the use of allowable stresses are not satisfied that strength design methods be used. Thus we no longer need to define values of the higher allowable stresses. This is supported by Section 1810.3.1.1, and other sections which endorse the use of strength design methods.

The existing provisions defining when increased allowable stresses could be used create additional problems since the criteria were not related to additional structural capacity. The load test provisions in Sections 1810.2.8 and 1810.3.3.1.2 address geotechnical failure modes and are not appropriate to evaluate structure failure modes and thus are inappropriate to justify increased member structural capacity. The load tests listed in this chapter are still useful in evaluating geotechnical failure modes but should not be used to define structural capacities.

A structural failure mode below the calculated capacity of the structural element would suggest either significant calculation error, damage during installation, or material not meeting the specified requirements. Load testing isolated piles is not the optimum way to identify these potential problems. Project controls are needed to identify and control these problems since if they occur the default allowable stresses may not be adequate.

The changes proposed here impact only the structural capacity of the deep foundation elements and not the geotechnical failure modes.

In several locations in Section 1810.3.1 instead of referring to “approved strength design methods” specific standards are listed. In the case of Timber piles and steel H piles the standards referenced are existing requirements. In the case of concrete the consensus of the foundation literature endorsed the use of ACI 318. The reference to ACI 318 makes it clear that the standard supplements but does not replace the existing provisions already in this Chapter. Listing specific design standards reduces any ambiguity as to what is acceptable.

1810.3.1

Range of sections listed is revised to reflect the sub sections added by this change.

The last sentence is added to make it clear that Section 1810.3.2.6 is subservient to Section 1810.3.1

1810.3.1.1

Specific reference to ACI is needed both to make specific the strength design provisions mentioned in the current version and because the special inspection provisions in Chapter 17 make reference to provisions of ACI 318 that would not be mandated for these deep foundation elements.

ACI 543 and ACI 336 endorse this approach. The appropriateness of adopting ACI 318 is further supported by that fact that ACI 318 already has design provisions for deep foundation concrete elements.

Item 1 is added to reflect the fact that prestressed piles are not addressed in ACI 318. Refer to the new Section 1905.1.11. Item 2 addresses the special case of small diameter piles cast-in-place concrete piles with permanent bracing.

1810.3.1.7

The language for timber piles was moved, unchanged, from Section 1810.3.2.4 since Section 1810.3.2 deals with materials and not design methodologies.

1810.3.1.8

Because this chapter defines the design standards for deep foundation elements it is necessary to specifically invoke the requirements in AISC 341 that are applicable in high seismic conditions.

1810.3.2.4

The design provisions are moved to Section 1810.3.1 which more appropriately deals with design conditions.

1810.3.2.6

The limitations on the use of concrete deep foundation elements in Section 18810.3.1.2 are made applicable to all deep foundation elements. When buckling is a concern or we are dealing with combined bending and axial forces a more robust methodology is appropriate.

The added language also makes it clear that the use of allowable stresses is subservient to the constraints of Section 1810.3.1 that defines constraints on design of deep foundation elements.

TABLE 1810.3.2.6

The line in item 1 referencing Section 1810.3.2.7 is deleted. Rather than defining increased allowable stress the engineer has the option of using the strength design provisions in Section 1810.3.1.1. Recognizing that applying strength design methods for the piles addressed in 1810.3.2.7 may be difficult because of difficulties with installing confinement reinforcement, Item 1 has been added to Section 1810.3.1.1 allowing the casing to be used as confinement reinforcement thus facilitating the application of strength design methods for these piles.

The lines in items 3 and 5 of the table referencing Section 1810.3.2.8 are deleted because the criteria is not relevant for evaluating structural capacity as opposed to geotechnical capacity. In the absence of the deleted item the designer would be directed to the new Section 1810.3.1.8 which references AISC 360 and AISC 341.

The provision for timber in item 6 of the table are deleted because they are already addressed in Section 1810.3.2.4

1810.3.2.7

This section has been reformatted since they no longer serve as prerequisites for higher allowable stresses.

The existing sub-section 2 would require the use of a mandrel when installing all permanent casing. The changes limit this requirement to the class of piles normally installed with mandrels.

1810.3.2.8

Load tests described in paragraph 1810.3.3.1.2 address the geotechnical capacity and not the structural capacity of deep foundation elements. Thus the provisions of this section should not be used to access the structural capacity of deep foundation elements.

The inspection requirements in the last paragraph are not necessary since Sections 1705.7 and 1705.8 already define the necessary special inspections.

1905.1.11:

Without this change to the scope of ACI 318 the IBC does not provide any technical criteria for the design of the structural aspects of concrete piles, drilled piers, and caissons. ACI 336 “Design and Construction of Drilled Piers”, and ACI 543 “Recommendations for Design, Manufacture of Concrete Piles”, endorse the use of ACI 318 to design these deep foundation elements. The change reflects current practice.

The change in scope of ACI 318 does not include adding prestressed concrete piles because of limited time to resolve technical concerns.

Cost Impact: The code change proposal will not increase the cost of construction.

S186-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.3.1-S-KERR.doc

S187–12

1810.3.2.3, Table 1810.3.2.6, 1810.3.5.3.1, 1810.3.5.3.2 (NEW), 1810.3.5.3.3 (NEW), Chapter 35 (NEW)

Proponent: Bonnie Manley, American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

1810.3.2.3 ~~Structural steel~~ Steel. Structural steel H-piles and structural steel sheet piling shall conform to the material requirements in ASTM A6. Steel pipe piles shall conform to the material requirements in ASTM A 252. ~~and~~ Fully welded steel piles shall be fabricated from plates ~~shall~~ that conform to the material requirements in ASTM A 36, ~~ASTM A 252~~, ASTM A 283, ASTM A 572, ASTM A 588 or ASTM A 690~~, ASTM A 913 or ASTM A 992~~.

TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS[a]
3. ~~Structural steel~~ Steel in compression	
Cores within concrete-filled pipes or tubes	$0.5\ F_y \leq 32{,}000$ psi
Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8	$0.5\ F_y \leq 32{,}000$ psi
Pipes or tubes for micropiles	$0.4\ F_y \leq 32{,}000$ psi
Other pipes, tubes or H-piles	$0.35\ F_y \leq 16{,}000$ psi
Helical piles	$0.6\ F_y \leq 0.5\ F_u$
5. ~~Structural steel~~ Steel in tension	
Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8	$0.5\ F_y \leq 32{,}000$ psi
Other pipes, tubes or H-piles	$0.35\ F_y \leq 16{,}000$ psi
Helical piles	$0.6\ F_y \leq 0.5\ F_u$

a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of ~~structural~~ steel; F_u is the specified minimum tensile stress of ~~structural~~ steel.

(Portions of Table not shown remain unchanged)

1810.3.5.3.1 Structural steel H-piles. Sections of structural steel H-piles shall comply with the requirements for HP shapes in ASTM A6, or the following:

1. The flange projections shall not exceed 14 times the minimum thickness of metal in either the flange or the web and the flange widths shall not be less than 80 percent of the depth of the section.
2. The nominal depth in the direction of the web shall not be less than 8 inches (203 mm).
3. Flanges and web shall have a minimum nominal thickness of 3/8 inch (9.5 mm).

1810.3.5.3.2 Fully welded steel piles fabricated from plates. Sections of fully welded steel piles fabricated from plates shall comply with the following:

1. The flange projections shall not exceed 14 times the minimum thickness of metal in either the flange or the web and the flange widths shall not be less than 80 percent of the depth of the section.
2. The nominal depth in the direction of the web shall not be less than 8 inches (203 mm).
3. Flanges and web shall have a minimum nominal thickness of 3/8 inch (9.5 mm).

1810.3.5.3.3 Structural steel sheet piling. Individual sections of structural steel sheet piling shall conform to the profile indicated by the manufacturer, and shall conform to the general requirements specified by ASTM A 6.

Add new standard to Chapter 35 as follows:

ASTM

<u>A6/A6M-11 Standard Specifications for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling</u>

Reason: Section 1810.3.2.3 of this proposal improves the clarity of Section 1810.3.2.3 as it applies to steel foundation elements. First, it coordinates the title with the language that follows. Structural steel is defined in Section 202 and steel pipe piles and fully welded steel piles do not necessarily fall into that classification. Second, the section assigns the appropriate ASTM references to the applicable foundation elements. ASTM A 252 applies only to steel pipe piles. ASTM A 913 and ASTM A 992 both apply to structural shapes and not plates, thus they are not appropriate for fully welded steel piles fabricated from plates. Finally, ASTM A 6 has been added as the appropriate reference for the material requirements for H-piles and another common steel foundation system -- sheet piling. Since ASTM A 6 includes references to all of the applicable listed ASTM standards – ASTM A 36, ASTM A 572, ASTM A 690, ASTM A 913, or ASTM A 992 – duplicate reference of those standards is not necessary for H-piles and sheet piling.

Table 1810.3.2.6 of this proposal coordinates the title change in Section 1810.3.2.3 with requirements in Table 1810.3.2.6. Structural steel is defined in Section 202 and steel pipe and fully welded steel piles do not necessarily fall into that classification, but the intent is to apply the allowable stress limits to those sections as well. Consequently, the term "structural" has been deleted.

1810.3.5.3.1, 1810.3.5.3.2 of this proposal clarifies the Section 1810.3.5.3 by separating the requirements for structural steel H-piles from fully welded steel piles fabricated from plates and adding a new section on structural steel sheet piling. Within the section on structural steel H-piles, Section 1810.3.5.3.1, reference is made to ASTM A 6 for HP shapes, which automatically satisfy the three specified dimensional limitations. Additionally, allowance is made for other structural steel H-pile shapes, if they meet the three dimensional limitations. Clarifying language is added as a new Section 1810.3.5.3.2 permitting the three dimensional limitations to be applied to fully welded steel piles fabricated from plates. Finally, Section 1810.3.5.3.3 is introduced for structural steel sheet piling requiring that the profiles conform to manufacturer's specifications and the general requirements in ASTM A 6.

Chapter 35 of this proposal adopts the latest edition of ASTM A 6 into Chapter 35.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S187-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.3.2.3-S-MANLEY.doc

S188–12
1810.3.2.5

Proponent: Mark Gilligan, P.E., S.E., representing self (mark@gilligan.name)

Revise as follows:

1810.3.2.5 Protection of materials. Where boring records or site conditions indicate possible deleterious action on the materials used in deep foundation elements because of soil constituents, changing water levels or other factors, the elements shall be adequately protected by materials, methods or processes *approved* by the *building official*. Protective materials shall be applied to the elements so as not to be rendered ineffective by installation. The effectiveness of such protective measures for the particular purpose shall have been thoroughly established by satisfactory service records or other evidence.

<u>The following protections will be considered to comply with this requirement:</u>

1. <u>Concrete in compliance with Chapters 4 and 7 of ACI 318.</u>
2. <u>Wood piles treated in accordance with Section 1810.3.2.4.1.</u>

Reason: The added language makes it clear that conformance with the listed criteria will satisfy the existing language. The current provision does not provide any objective basis for the building official or engineer to evaluate the protection needed. The proposed criteria are already requirements in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

S188-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.3.2.5-S-GILLIGAN.doc

S189–12
1810.3.3.1.2

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1810.3.3.1.2 Load tests. ~~Where design compressive loads are greater than those determined using the allowable stresses specified in Section 1810.3.2.6,~~ Where the design load for any deep foundation element is in doubt, or where cast-in-place deep foundation elements have an enlarged base formed either by compacting concrete or by driving a precast base, control test elements shall be tested in accordance with ASTM D 1143 or ASTM D 4945. At least one element shall be load tested in each area of uniform subsoil conditions. Where required by the *building official*, additional elements shall be load tested where necessary to establish the safe design capacity. The resulting allowable loads shall not be more than one-half of the ultimate axial load capacity of the test element as assessed by one of the published methods listed in Section 1810.3.3.1.3 with consideration for the test type, duration and subsoil. The ultimate axial load capacity shall be determined ~~by a *registered design professional*~~ with consideration given to tolerable total and differential settlements at design load in accordance with Section 1810.2.3. In subsequent installation of the balance of deep foundation elements, all elements shall be deemed to have a supporting capacity equal to that of the control element where <u>all of the following are satisfied:</u>

1. ~~such~~ Elements are of the same type, size and relative length as the test element;
2. <u>Elements</u> are installed using the same or comparable methods and equipment as the test element;
3. <u>Elements</u> are installed in similar subsoil conditions as the test element; ~~and,~~
4. For driven elements, where the rate of penetration (e.g., net displacement per blow) of such elements is equal to or less than that of the test element driven with the same hammer through a comparable driving distance.

Reason: This section addresses capacity of the soil or of the soil to foundation element transfer and thus the tests are not appropriate to evaluate the structural capacity of the deep foundation element. Thus the reference to Section 1810.3.2.6 is not appropriate.

Reference to registered design professional is deleted because it is redundant.

The last sentence of the last paragraph has been reorganized to make it more readable.

Cost Impact: The code change proposal will not increase the cost of construction.

S189-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.3.3.1.2-S-KERR.doc

S190–12
1810.3.3.1.6

Proponent: Lori A. Simpson, P.E., GE, Treadwell & Rollo, a Langan Company, representing Deep Foundations Institute

Revise as follows:

1810.3.3.1.6 Uplift capacity of grouped deep foundation elements. For grouped deep foundation elements subjected to uplift, the allowable working uplift load for the group shall be calculated by an *approved* method of analysis. Where the deep foundation elements in the group are placed at a center-to-center spacing ~~of at least 2.5~~ less than three times the least horizontal dimension of the largest single element, the allowable working uplift load for the group is permitted to be calculated as the lesser of:

1. The proposed individual allowable working uplift ~~working~~ load times the number of elements in the group.
2. Two-thirds of the effective weight of the group and the soil contained within a block defined by the perimeter of the group and the length of the element, plus two-thirds of the ultimate shear resistance long the soil block.

Reason: A period is added because there was a run on sentence which rendered the section unclear. Also, the spacing is clarified to be consistent with Section 1810.2.5. Section 1810.3.3.1.6 had defined the need to evaluate group effects where spacing is at least 2.5 times the least horizontal dimension, but did not define a maximum spacing at which group effects did not need to be evaluated. The minimum spacing for evaluation of group effects on uplift capacity is not appropriate. Section 1810.2.5 says that group effects only need to be evaluated where the spacing is less than 3 times the least horizontal dimension, so that is repeated herein for consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

S190-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.3.3.1.6-S-SIMPSON.doc

S191–12
1810.4.12

Proponent: Mark Gilligan, S.E., representing self (mark@gilligan.name)

Delete without substitution:

~~**1810.4.12 Special inspection.** *Special inspections* in accordance with Sections 1705.7 and 1705.8 shall be provided for driven and cast-in-place deep foundation elements, respectively. *Special inspections* in accordance with Section 1705.9 shall be provided for helical piles.~~

Reason: This paragraph is redundant. This would imply the need for cross references from each of the material sections

Cost Impact: The code change proposal will not increase the cost of construction.

S191-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.4.12-S-GILLIGAN.doc

S192–12
1810.4.3

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

1810.4.3 Location plan. A plan showing the location and designation of deep foundation elements by an identification system shall be ~~filed with the *building official*~~ prepared prior to installation of such elements. The location plan shall be submitted with the special inspection report prepared for deep foundation elements. Detailed records for elements shall bear an identification corresponding to that shown on the plan.

Reason: Since the purpose of the location plan is to allow interpretation of the inspection reports, the location plan should be provided with the special inspection report.

Cost Impact: The code change proposal will not increase the cost of construction.

S192-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1810.4.3-S-KERR.doc

S193–12
1901.3

Proponent: Matthew Senecal, P.E., representing American Concrete Institute (ACI)

Revise as follows:

1901.3 Construction documents. The *construction documents* for structural concrete construction shall include:

1. The specified compressive strength of concrete at the stated ages or stages of construction for which each concrete element is designed.
2. The specified strength or grade of reinforcement.
3. The size and location of structural elements, reinforcement, embeds, and anchors.
4. Provision for dimensional changes resulting from creep, shrinkage and temperature.
5. The magnitude and location of prestressing forces.
6. Anchorage length of reinforcement and location and length of lap splices.
7. Type and location of mechanical and welded splices of reinforcement.
8. Details and location of contraction or isolation joints specified for plain concrete.
9. Minimum concrete compressive strength at time of posttensioning.
10. Stressing sequence for post-tensioning tendons.
11. ~~For structures assigned to *Seismic Design Category* D, E or F,~~ A statement if slab on grade is designed as a structural diaphragm.
12. Protective coatings and systems of reinforcement.
13. Post-installed anchor installation requirement.
14. Concrete cover to reinforcement, embedments, and anchors.
15. Tolerances on cover, reinforcement placement, and dimensions of structural elements.
16. Concrete exposure category and class as defined in 1904.

Reason: This requirement is similar to 1.2.1 in ACI 318-11. It is provided here as a checklist for the building code official. ACI 318 does, however, have a few more mandatory items specified in other parts of the code. This amendment addresses those additional items.

Item 11 was adjusted for all structures. It is important that all parties, present and future, know if the slab serves an essential structural purpose. This is independent of whether seismic loads are predominating or not.

Cost Impact: The code change proposal will not increase the cost of construction.

S193-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1901.3-S-SENECAL

S194–12
1901.3

Proponent: Stephen V. Skalko, Portland Cement Association

Delete without substitution:

~~**1901.3 Construction documents.** The *construction documents* for structural concrete construction shall include:~~

1. ~~The specified compressive strength of concrete at the stated ages or stages of construction for which each concrete element is designed.~~
2. ~~The specified strength or grade of reinforcement.~~
3. ~~The size and location of structural elements, reinforcement and anchors.~~
4. ~~Provision for dimensional changes resulting from creep, shrinkage and temperature.~~
5. ~~The magnitude and location of prestressing forces.~~
6. ~~Anchorage length of reinforcement and location and length of lap splices.~~
7. ~~Type and location of mechanical and welded splices of reinforcement.~~
8. ~~Details and location of contraction or isolation joints specified for plain concrete.~~
9. ~~Minimum concrete compressive strength at time of posttensioning.~~
10. ~~Stressing sequence for post-tensioning tendons.~~
11. ~~For structures assigned to *Seismic Design Category* D, E or F, a statement if slab on grade is designed as a structural diaphragm.~~

Reason: There are three reasons this code change is needed to modify Chapter 19 “Concrete” of the *International Building Code* (IBC):

1. This proposal eliminates duplications between the IBC and ACI 318. ACI 318 already addresses the requirements for construction documents in Chapter 1.
2. Changes to requirements for construction documents in ACI 318 will not conflict with a separate list in the IBC
3. The list in the IBC is only a partial listing of the requirements in ACI 318 suggesting that the other requirements for reporting information in construction documents in accordance with ACI 318 are not necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

S194-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1901.3-S-SKALKO.doc

S195–12
1903.1, 1903.2, 1903.3

Proponent: Stephen V. Skalko, Portland Cement Association

Revise as follows:

~~**1903.1 General.** Materials used to produce concrete, concrete itself and testing thereof shall comply with the applicable standards listed in ACI 318. *Where required, special inspections and tests shall be in accordance with Chapter 17.*~~

~~1903.2~~ 1903.1 Glass fiber reinforced concrete. *Glass fiber reinforced concrete (GFRC) and the materials used in such concrete shall be in accordance with the PCI MNL 128 standard.*

~~1903.3~~ 1903.2 Flat wall insulating concrete form (ICF) systems. *Insulating concrete form material used for forming flat concrete walls shall conform to ASTM E 2634*.

Reason: "Section 1901.2 Plain and reinforced concrete." already requires that materials and tests be in compliance with ACI 318. This redundancy is not required. Also, provisions of chapter 17 of the code are applicable based on Section 1901.4. The language "Where required, special inspections and tests shall be in accordance with Chapter 17." is unnecessary and is being deleted**.**

Cost Impact: The code change proposal will not increase the cost of construction.

S195-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1903.1 #1-S-SKALKO.doc

S196–12
1903.1, 1903.2 (NEW), Chapter 35 (NEW)

Proponent: Stephen V. Skalko, Portland Cement Association

Revise as follows:

1903.1 General. Materials used to produce concrete, concrete itself and testing thereof shall comply with the applicable standards listed in ACI 318.

Exception. The following standards as referenced in Chapter 35 shall be permitted to be used.

1. ASTM C 150
2. ASTM C 595
3. ASTM C 1157

1903.2 Special Inspections. *Where required, special inspections and tests shall be in accordance with Chapter 17.*

Add new standards to Chapter 35:

ASTM

C150-12 Specification for Portland Cement

C595-12 Specification for Blended Hydraulic Cement

C1157-11 Standard Performance Specification for Hydraulic Cement

Reason: To update the specifications standards for Portland Cement, Blended Hydraulic Cement, and Hydraulic Cement referenced for use in concrete. Due to the change in the IBC code development cycle, ACI 318-11 may be the edition finally referenced for concrete in IBC 2015. ACI 318-11 references the 2009 editions of C150, C595 and C1157, which would be more than five years out of date by 2015.

ASTM Committee C01 approved modifications included in the most recent editions of these cement standards that are compatible with ACI 318-11 or ACI 318-14 and provide improvements to the standards as follows:

ASTM C150-12

Compared to ASTM C150-09 referenced in ACI 318-11, ASTM C150-12 includes revisions that:

1. Make the air permeability test the default method for determining compliance with specific surface fineness requirements and moves determination by the turbidimetric method to the optional table. This reflects industry practice.
2. Clarification on Type II (MH) moderate heat and moderate sulfate resistant cement heat index requirements, clarification on procedure for determining potential phase (Bogue) composition, and some additional minor improvements. No changes are made to the physical or chemical requirements of C150.

Additionally, compared to ASTM C150-07*a* referenced in IBC 2012 Chapter 35, ASTM C150-12 includes revisions to:

1. Distinguish between organic and inorganic processing additions and include a limit of 5% on inorganic processing additions and 1% on organic processing additions.
2. Modify procedures for determining potential phase composition to account for effect of inorganic processing additions in cement on potential phase composition calculations.
3. Include provisions for a Type II (MH) designation for moderate heat and moderate sulfate resistant cement.
4. Various other minor improvements. Again no changes were made to the physical or chemical requirements of C150 for portland cements.

The variations in product that will result from the use of C150-12 versus C150-07 will not adversely impact the performance of concrete with regard to compliance with ACI 318 or the provisions of the IBC.

C595-12

Compared to C595-09 referenced in ACI 318-11, ASTM C595-12 includes revisions to:

1. Include provisions for a new Type IL portland-limestone blended cement designation for cement containing from 5% to 15% limestone. C595 Type IL has same physical requirements as Type IP and IS (<70), which are also comparable to ASTM C150 physical requirements. Portland-limestone cement provides an alternative for improving the sustainability of concrete.
2. Several clarifications and improvements to the C595 provisions for Type IT ternary blended cements.
3. Clarifications and improvements to C595 naming practice used to identify amount slag, pozzolan or limestone contained in blended cements.

Additionally, compared to C595-08a referenced in IBC 2012 Chapter 35, ASTM C595-12 also includes provisions for Type IT ternary blended cement (cements containing portland cement with either a combination of two different pozzolans, or slag cement and a pozzolan, a pozzolan and a limestone, or a slag cement and a limestone). Ternary blended cements have the same physical requirements as Type IT and Type IS (<70) cements. Ternary blended cements were first introduced in the 2009 edition of ASTM C595.

The variations in product that will result from the use of C595-12 versus C595-08a will not adversely impact the performance of concrete with regard to compliance with ACI 318 or the provisions of the IBC.

ASTM C1157-12

Compared to C1157-09 referenced in ACI 318-11, ASTM C595-12 includes revisions to:

1. Include provisions for distinguishing between air entraining and non air-entraining C1157 cements with appropriate designations and limits consistent with those of ASTM C150 and C595 for air entraining and non air entraining cements.
2. A minor modification to correct the significant figures for minimum strength limits for SI unit values listed in Table 1.

The variations in product that will result from the use of C1157-12 versus C1157-09 will not adversely impact the performance of concrete with regard to compliance with ACI 318 or the provisions of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S196-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1903.1 #2-S-SKALKO.doc

S197–12
1903.2

Proponent: Matthew Senecal, P.E., representing American Concrete Institute (ACI)

Revise as follows:

1903.2 Glass fiber reinforced concrete. *Glass fiber reinforced concrete (GFRC) and the materials used in ~~such~~ nonstructural precast concrete elements shall be in accordance with the PCI MNL 128 standard.*

Reason: This is a clarification on what concrete elements are covered by PCI MNL 128.

Cost Impact: The code change proposal will not increase the cost of construction.

S197-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1903.2-S-SENECAL

S198–12

1903.4 (NEW), Chapter 35 (NEW)

Proponent: James K. Hicks, P.E., Cera Tech, P.E., representing self (jim.hicks@ceratechinc.com)

Add new text as follows:

1903.4 Rapid hardening concrete. Rapid hardening concrete shall be permitted to be produced using hydraulic cement conforming to ASTM C1600.

Add new standard to Chapter 35 as follows:

ASTM

C 1600-11 Standard Specification for Rapid Hardening Hydraulic Cement

Reason: In those instances wherein rapid hardening is desired, cements conforming to ASTM C 1600 Standard Specification for Rapid hardening Hydraulic Cements are generally desirable and useable. ASTM C 1600 can be one of four cement types, General Rapid Hardening (GRH), Moderate Rapid Hardening (MRH), Very Rapid Hardening (VRH) and Ultra Rapid Hardening (URH). C 1600 is a Specification giving numerous performance requirements. Primary characteristics (with inherent increased design flexibility) are:

•Can produce rapid-hardening concrete, precast concrete, block, mortar and grout.
•Depending on the type cement used and the specific mixture, cements meeting ASTM C 1600 can provide either normal, medium or fast time to service (1.5 to 48 h)
•ASTM C 1600 has rigid durability requirements.

ASTM C 1600 cements are used in products such as:

- Materials for Concrete Repairs
- High Strength Grouts
- Precast
- Paving
- Some Cements - Mass Concrete
- Some Cements – Heat Resistant
- Some Cements – Chemical Resistant

In addition to following pertinent ACI and ASTM requirements, users of C 1600 cements must heed manufacturers instructions for use. Specific durability aspects of any given mortar or concrete to be evaluated by the appropriate test method(s).

Cost Impact: Economic cost of the concrete utilizing C 1600 cements while it may be approximately equal or higher when comparing cementitious to cementitious, is typically negligible for the concrete when considering the costs of other ingredients, transport, placement, finishing and curing.
Environmental costs are generally lower with C 1600 cements as fuel use is generally less, or with the case of activated fly ash based cements, no fuel is used and grinding is not required.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S198-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1903.4 (NEW)-HICKS.doc

S199–12

1904.1, 1904.2, Figure 1904.2, Table 1904.2

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Delete and substitute as follows:

~~**1904.1 Exposure categories and classes.** Concrete shall be assigned to exposure classes in accordance with the durability requirements of ACI 318 based on:~~

1. ~~Exposure to freezing and thawing in a moist condition or deicer chemicals;~~
2. ~~Exposure to sulfates in water or soil;~~
3. ~~Exposure to water where the concrete is intended to have low permeability; and~~
4. ~~Exposure to chlorides from deicing chemicals, salt, saltwater, brackish water, seawater or spray from these sources, where the concrete has steel reinforcement.~~

~~**1904.2 Concrete properties.** Concrete mixtures shall conform to the most restrictive maximum water-cementitious materials ratios, maximum cementitious admixtures, minimum air-entrainment and minimum specified concrete compressive strength requirements of ACI 318 based on the exposure classes assigned in Section 1904.1.~~

> ~~**Exception:** For occupancies and appurtenances thereto in Group R occupancies that are in buildings less than four stories above grade plane, normal-weight aggregate concrete is permitted to comply with the requirements of Table 1904.2 based on the weathering classification (freezing and thawing) determined from Figure 1904.2 in lieu of the durability requirements of ACI 318.~~

~~TABLE 1904.2~~
~~MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f'_c)~~

~~TYPE OR LOCATION OF CONCRETE CONSTRUCTION~~	~~MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f'_c at 28 days, psi)~~		
	~~Negligible exposure~~	~~Moderate exposure~~	~~Severe exposure~~
~~Basement walls[c] and foundations not exposed to the weather~~	~~2,500~~	~~2,500~~	~~2,500[a]~~
~~Basement slabs and interior slabs on grade, except garage floor slabs~~	~~2,500~~	~~2,500~~	~~2,500[a]~~
~~Basement walls[c], foundation walls, exterior walls and other vertical concrete surfaces exposed to the weather~~	~~2,500~~	~~3,000[b]~~	~~3,000[b]~~
~~Driveways, curbs, walks, patios, porches, carport slabs, steps and other flatwork exposed to the weather, and garage floor slabs~~	~~2,500~~	~~3,000[b,d]~~	~~3,500[b,d]~~

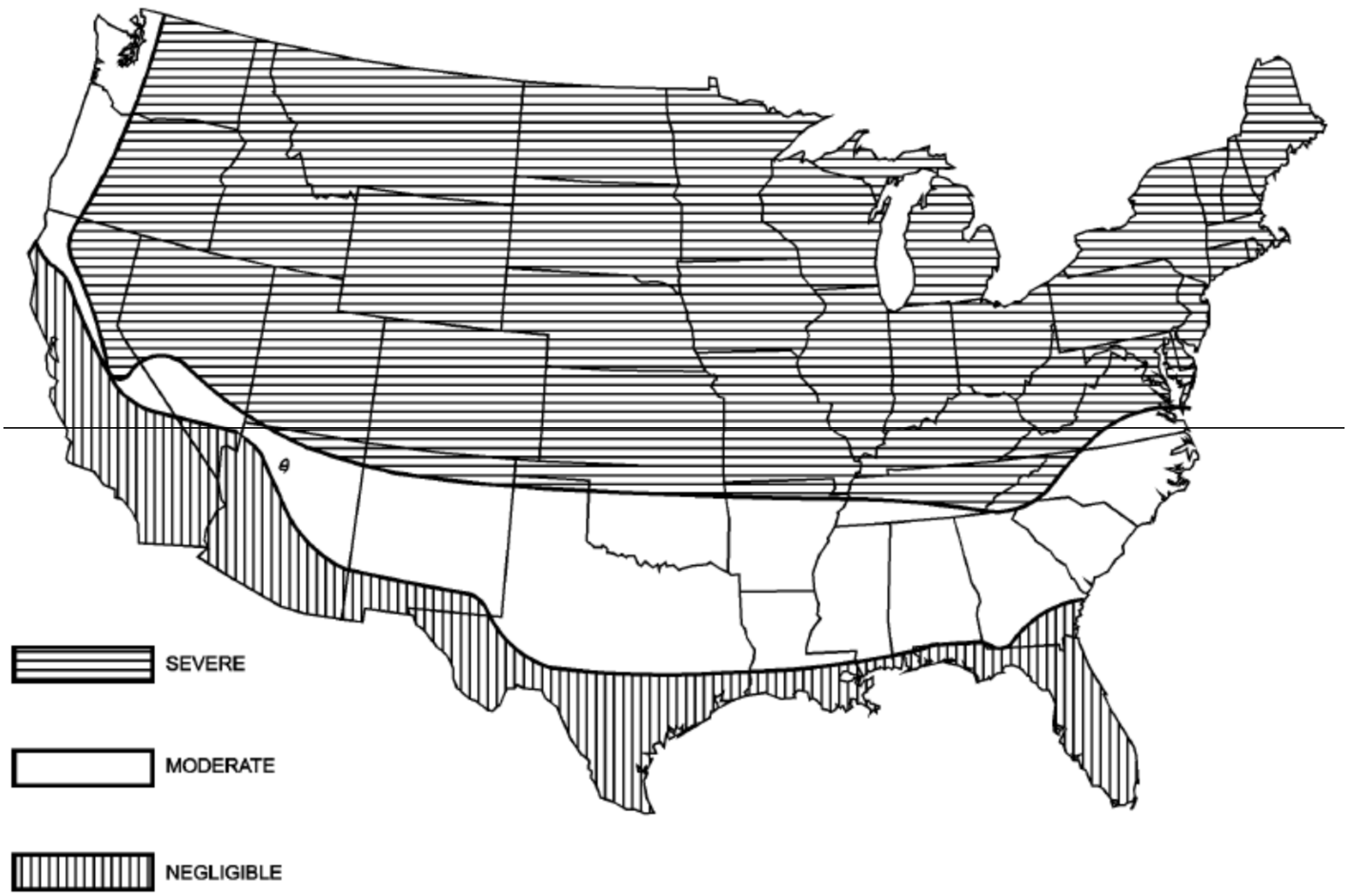
~~For SI: 1 pound per square inch = 0.00689 MPa.~~

a. ~~Concrete in these locations that can be subjected to freezing and thawing during construction shall be of air-entrained concrete in accordance with Section 1904.2.~~

b. ~~Concrete shall be air entrained in accordance with ACI 318.~~

c. ~~Structural plain concrete basement walls are exempt from the requirements for exposure conditions of Section 1904.2.~~

d. ~~For garage floor slabs where a steel trowel finish is used, the total air content required by ACI 318 is permitted to be reduced to not less than 3 percent, provided the minimum specified compressive strength of the concrete is increased to 4,000 psi.~~



~~**FIGURE 1904.2**~~
~~**WEATHERING PROBABILITY MAP FOR CONCRETE[a,b,c]**~~

~~a. Lines defining areas are approximate only. Local areas can be more or less severe than indicated by the region classification.~~
~~b. A "severe" classification is where weather conditions encourage or require the use of deicing chemicals or where there is potential for a continuous presence of moisture during frequent cycles of freezing and thawing. A "moderate" classification is where weather conditions occasionally expose concrete in the presence of moisture to freezing and thawing, but where deicing chemicals are not generally used. A "negligible" classification is where weather conditions rarely expose concrete in the presence of moisture to freezing and thawing.~~
~~c. Alaska and Hawaii are classified as severe and negligible, respectively.~~

1904.1 Structural concrete. Structural concrete shall conform to the durability requirements of ACI 318.

1904.2 Nonstructural concrete. The registered design professional shall assign nonstructural concrete a freeze-thaw exposure class, as defined in ACI 318, based on the anticipated exposure of nonstructural concrete. Nonstructural concrete shall have a minimum specified compressive strength, f'_c, of 2500 psi for Class F0; 3000 psi for Class F1; and 3500 psi for Classes F2 and F3. Nonstructural concrete shall be air entrained in accordance with ACI 318.

Reason: This proposal replaces the weathering probability map with ACI 318's performance requirements; removes the exception for structural concrete; and clarifies the durability requirements for nonstructural concrete.

Probability map: The weathering probability map for concrete can be inaccurate since it is possible to have "severe," "moderate," or "negligible" environments in any of the predefined zones shown on the map. ACI 318 requires the designer to classify concrete into one of the freezing and thawing classes as follows:

F0 – Concrete not exposed to freezing-and-thawing cycles
F1 – Concrete exposed to freezing-and-thawing cycles and occasional exposure to moisture

F2 – Concrete exposed to freezing-and-thawing cycles and in continuous contact with moisture

F3 – Concrete exposed to freezing-and-thawing cycles and in continuous contact with moisture and exposed to deicing chemicals

The concrete classes must be applied by the designer, regardless of geographic location. The commentary to ACI 318 provides further discussion and examples to help the designer determine the appropriate class. It is therefore recommended to remove the map and adopt the ACI 318 approach.

Table: The first and second rows of the table provide limits for interior concrete. Interior concrete is equivalent to Class F0 in ACI 318, which requires a minimum concrete compressive strength of 2500 psi. Therefore, the minimum concrete compressive strength requirements listed in the first two rows are the same as the minimum requirements of ACI 318 and may be removed.

The third row of the table provides an exception for exterior structural concrete walls above or below ground. The exception allows for 3000 psi concrete for any environment other than "negligible" or Class F0. Research[1-2] shows that concrete with a minimum amount of hydrated cement resists the negative effects of freezing and thawing. ACI 318 has determined that 4500 psi concrete provides adequate cement hydration for the range of available concrete mixtures used in construction. It is therefore recommended to remove this exception for structural concrete.

The fourth row of the table states strength limits for exterior nonstructural concrete. ACI 318 does not have durability requirements for nonstructural concrete. Therefore, these limits are not an exception to 318 but a requirement. These limits are simply restated in terms of exposure classes as shown in the revision. The limitation on building category and concrete type have been removed, since this appears to be a misunderstanding of what is required in ACI 318.

References:

1. Klieger, P., 1956, "Curing Requirements for Scale Resistance of Concrete," Highway Research Board Bulletin 150, pp.18-31. (PCA Bulletin 82)

2. Mather, B., 1990, "How to Make Concrete that will be Immune to the Effects of Freezing and Thawing," Paul Klieger Symposium on Performance of Concrete, SP-122, D. Whiting, ed., American Concrete Institute, Farmington Hills, MI, pp. 1-18.

Cost Impact: The code change proposal may increase the cost of construction for structural concrete but decrease the cost for nonstructural concrete. By changing the requirement from geometric location to performance criteria, the cost will increase or decrease depending on location and exposure.

S199-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1904.1 (NEW)-S-SENECAL

S200–12
1904, 1904.1, 1904.2, Table 1904.2, Figure 1904.2

Proponent: Stephen V. Skalko, Portland Cement Association

Delete without substitution:

~~**SECTION 1904**~~
~~**DURABILITY REQUIREMENTS**~~

~~**1904.1 Exposure categories and classes.** Concrete shall be assigned to exposure classes in accordance with the durability requirements of ACI 318 based on:~~

1. ~~Exposure to freezing and thawing in a moist condition or deicer chemicals;~~
2. ~~Exposure to sulfates in water or soil;~~
3. ~~Exposure to water where the concrete is intended to have low permeability; and~~
4. ~~Exposure to chlorides from deicing chemicals, salt, saltwater, brackish water, seawater or spray from these sources, where the concrete has steel reinforcement.~~

~~**1904.2 Concrete properties.** Concrete mixtures shall conform to the most restrictive maximum water-cementitious materials ratios, maximum cementitious admixtures, minimum air-entrainment and minimum specified concrete compressive strength requirements of ACI 318 based on the exposure classes assigned in Section 1904.1.~~

> ~~**Exception:** For occupancies and appurtenances thereto in Group R occupancies that are in buildings less than four stories above grade plane, normal-weight aggregate concrete is permitted to comply with the requirements of Table 1904.2 based on the weathering classification (freezing and thawing) determined from Figure 1904.2 in lieu of the durability requirements of ACI 318.~~

~~**TABLE 1904.2**~~
~~**MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f'_c)**~~

~~**FIGURE 1904.2**~~
~~**WEATHERING PROBABILITY MAP FOR CONCRETE[a, b, c]**~~

Reason: There are three reasons that support this code change intended to modify Chapter 19 "Concrete" of the *International Building Code* (IBC):

1. This proposal removes redundancies in language and reference to specific sections of ACI 318. Such redundancies are not necessary and may be detrimental in that they may cause confusion and result in errors. The introductory section of Chapter 19, "1901.2 Plain and reinforced concrete" adequately and appropriately requires compliance with ACI 318.
2. Current language and approaches referenced in the IBC are inconsistent with both the methods for classifying exposure and the requirements for concrete based on the various exposures. Exposures are no longer limited to freeze-thaw durability and weathering. The new criteria in ACI 318 address freezing and thawing, sulfate, low permeability and corrosion protection. The weathering probability map in no way reflects the problems associated with sulfate exposure. The map puts areas that have the potential for high sulfate exposure into the negligible category.
3. It is clearly not the intent of ACI 318 to have provisions that are only applicable to certain structures. ACI 318 has been developed and is intended for use in such a manner that all provisions are applicable for all structural concrete regardless of occupancy. All provisions of ACI 318 are applicable to all structural concrete regardless of occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

S200-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1904-S-SKALKO.doc

S201–12
202, 1901.2, 1902, 1905.1 thru 1905.1.10, 1906.1

Proponent: Stephen V. Skalko, P.E., Portland Cement Association

Add new text as follows:

SECTION 202
DEFINITIONS

WALL PIER. A wall segment with a horizontal length-to-thickness ratio of at least 2.5, but not to exceed 6, whose clear height is at least two times its horizontal length.

Revise as follows:

1901.2 Plain and reinforced concrete. Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 ~~as amended in Section 1905 of this code~~. Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical loads or lateral forces from other parts of the structure to the soil.

~~**1902.1 General.** The words and terms defined in ACI 318 shall, for the purposes of this chapter and as used elsewhere in this code for concrete construction, have the meanings shown in ACI 318 as modified by Section 1905.1.1.~~

~~**1905.1 General.** The text of ACI 318 shall be modified as indicated in Sections 1905.1.1 through 1905.1.10.~~

~~**1905.1.1 ACI 318, Section 2.2.** Modify existing definitions and add the following definitions to ACI 318, Section 2.2.~~

~~**DESIGN DISPLACEMENT.** Total lateral displacement expected for the design-basis earthquake, *as specified by Section 12.8.6 of ASCE 7.*~~

~~***DETAILED PLAIN CONCRETE STRUCTURAL WALL.*** *A wall complying with the requirements of Chapter 22, including 22.6.7.*~~

~~***ORDINARY PRECAST STRUCTURAL WALL.*** *A precast wall complying with the requirements of Chapters 1 through 18.*~~

~~**ORDINARY REINFORCED CONCRETE STRUCTURAL WALL.** A *cast-in-place* wall complying with the requirements of Chapters 1 through 18.~~

~~**ORDINARY STRUCTURAL PLAIN CONCRETE WALL.** A wall complying with the requirements of Chapter 22, *excluding 22.6.7*.~~

~~**SPECIAL STRUCTURAL WALL**. A cast-in-place or precast wall complying with the requirements of 21.1.3 through 21.1.7, 21.9 and 21.10, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls *or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural wall."*~~

~~***WALL PIER.*** *A wall segment with a horizontal length-to thickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.*~~

~~**1905.1.2 ACI 318, Section 21.1.1.**~~
~~**1905.1.3 ACI 318, Section 21.4.**~~
~~**1905.1.4 ACI 318, Section 21.9.**~~
~~**1905.1.5 ACI 318, Section 21.10.**~~
~~**1905.1.6 ACI 318, Section 21.12.1.1.**~~
~~**1905.1.7 ACI 318, Section 22.6.**~~
~~**1905.1.8 ACI 318, Section 22.10.**~~
~~**1905.1.9 ACI 318, Section D.3.3.**~~
~~**1905.1.10 ACI 318, Section D.4.2.2.**~~

1906.1 Scope. The design and construction of structural plain concrete, both cast-in-place and precast, shall comply with the minimum requirements of ACI 318~~, as modified in Section 1905~~.

> **Exception:** For Group R-3 occupancies and buildings of other occupancies less than two stories above grade plane of light-frame construction, the required footing thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall.

Reason: There are four main reasons in support of this code change intended as modifications of Chapter 19 "Concrete" of the *International Building Code* (IBC):

1) The requirements and modifications that currently appear in Section 1905 of the 2012 edition of the IBC have been appropriately considered via an ANSI accredited standards development process. Modifications to ACI 318 in the IBC are unnecessary.
2) The proposal removes redundancies in definitions of ACI 318. Such redundancies are not necessary and may be detrimental in that they may cause confusion and result in errors. The introductory section of Chapter 19, "1901.2 Plain and reinforced concrete" adequately and appropriately requires compliance with ACI 318.
3) This proposal improves the consistency of this chapter with other chapters of the IBC such as Chapter 20 which simply states: "Aluminum used for structural purposes in buildings and structures shall comply with AA ASM 35 and AA ADM 1. The nominal loads shall be the minimum design loads required by Chapter 16."
4) If the chapters and sections in whatever edition of ACI 318 that becomes referenced in the 2015 edition of the IBC are not properly coordinated, there will be confusion and will increase the potential for errors in design and construction.

In addition to these general reasons specific additional reasons are provided for each part:

Section 1902.1in the IBC simply directs the user to the appropriate sections of ACI 318 which are already mandated in Section 1901.2. This deletes redundant language.

Section 1905

- "Design displacement" is adequately and appropriately defined in ACI 318.
- Current definition of "Detailed plain concrete structural wall" is not a definition and inappropriately sets design and construction criteria in a definition. Further if the wall is in compliance with Chapter 22 then it is also in compliance with Section 22.6.7 and the redundancy is not necessary.
- Current definition of "Ordinary precast structural wall" is not a definition and inappropriately sets design and construction criteria in a definition.
- Current definition of "Ordinary reinforced concrete structural wall" is not a definition and inappropriately sets design and construction criteria in a definition.
- Current definition of "Ordinary structural plain concrete wall" is not a definition and inappropriately sets design and construction criteria in a definition.
- Current definition of "Special structural wall" is not a definition and inappropriately sets design and construction criteria in a definition. This definition also further modifies the definitions in ASCE 7 increasing confusing.

Wall pier

- The definition of "Wall pier" is not specific to concrete and should be included in Chapter 2.

Section 1905.1.2 thru 1905.1.10

Most of the current sections in the IBC simply direct the user to the appropriate sections of ACI 318 which are already mandated in Section 1901.2. In addition, these provisions have been addressed by the ACI 318 Committee.

Cost Impact: The code change proposal will not increase the cost of construction.

S201-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1901.2-S-SKALKO.doc

S202–12

1905.1.1, 1905.1.3, 1905.1.4, 1905.1.9, 1905.1.10

Proponent: Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

1905.1.1 ACI 318, Section 2.2. Modify existing definitions and add the following definitions to ACI 318, Section 2.2.

DESIGN DISPLACEMENT. Total lateral displacement expected for the design-basis earthquake, *as specified by Section 12.8.6 of ASCE 7.*

DETAILED PLAIN CONCRETE STRUCTURAL WALL. *A wall complying with the requirements of Chapter 22, including 22.6.7.*

ORDINARY PRECAST STRUCTURAL WALL. *A precast wall complying with the requirements of Chapters 1 through 18.*

ORDINARY REINFORCED CONCRETE STRUCTURAL WALL. A *cast-in-place* wall complying with the requirements of Chapters 1 through 18.

ORDINARY STRUCTURAL PLAIN CONCRETE WALL. A wall complying with the requirements of Chapter 22, *excluding 22.6.7*.

SPECIAL STRUCTURAL WALL. A cast-in-place or precast wall complying with the requirements of 21.1.3 through 21.1.7, 21.9 and 21.10, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls *or ordinary precast structural walls, as applicable*. *Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural wall."*

~~***WALL PIER.*** *A wall segment with a horizontal length-to-thickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.*~~

1905.1.3 ACI 318, Section 21.4. Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, ~~21.4.5, 21.4.6 and 21.4.7~~ to read as follows:

21.4.3 - Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.
21.4.4 - Elements of the connection that are not designed to yield shall develop at least 1.5 *Sy*.
~~*21.4.5 - Wall piers in Seismic Design Category D, E or F shall comply with Section 1905.1.4 of the International Building Code.*~~
~~*21.4.6 - Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).*~~

~~***Exceptions:***~~

1. ~~*Wall piers that satisfy 21.13.*~~
2. ~~*Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*~~

~~*21.4.7 - Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.*~~

~~**1905.1.4 ACI 318, Section 21.9.** Modify ACI 318, Section 21.9, by deleting Section 21.9.8 and replacing with the following:~~

~~*21.9.8 - Wall piers and wall segments.*~~
~~*21.9.8.1 - Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in 21.9.8.2.*~~

~~***Exceptions:***~~

1. ~~*Wall piers that satisfy 21.13.*~~
2. ~~*Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segment have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*~~

~~*21.9.8.2 - Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces determined from 21.6.5.1. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).*~~
~~*21.9.8.3 - Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.*~~

~~**1905.1.9 ACI 318, Section D.3.3.** Delete ACI 318 Sections D.3.3.4 through D.3.3.7 and replace with the following:~~

~~*D.3.3.4 - The anchor design strength associated with concrete failure modes shall be taken as 0.75∅N_n and 0.75∅V_n, where ∅ is given in D4.3 or D4.4 and N_n and V_n are deteremined in accordance with D5.2, D5.3, D5.4, D6.2 and D6.3, assuming the concrete is cracked unless it can be demonstrated that the concrete remains uncracked.*~~
~~*D.3.3.5 - Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.6 or D.3.3.7 is satisfied.*~~

~~***Exceptions:***~~

1. ~~*Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy* Section D.3.3.5.~~
2. ~~*D.3.3.5 need not apply and the design shear strength in accordance with D.6.2.1(c) need not be computed for anchor bolts attaching wood sill plates of bearing or non-bearing walls of light-frame wood structures to foundations or foundation stem walls provided all of the following are satisfied:*~~
   - ~~*2.1. The allowable in-plane shear strength of the anchor is determined in accordance with AF&PA NDS Table 11E for lateral design values parallel to grain.*~~
   - ~~*2.2 The maximum anchor nominal diameter is 5/8 inches (16 mm).*~~
   - ~~*2.3. Anchor bolts are embedded into concrete a minimum of 7 inches (178 mm).*~~
   - ~~*2.4. Anchor bolts are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the wood sill plate.*~~
   - ~~*2.5. Anchor bolts are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate.*~~
   - ~~*2.6. The sill plate is 2-inch or 3-inch nominal thickness.*~~
3. ~~*Section D.3.3.5 need not apply and the design shear strength in accordance with Section*~~

~~*D.6.2.1(c) need not be computed for anchor bolts attaching cold-formed steel track of bearing or non-bearing walls of light-frame construction to foundations or foundation stem walls provided all of the following are satisfied:*~~

~~*3.1. The maximum anchor nominal diameter is 5/8 inches (16 mm).*~~
~~*3.2. Anchors are embedded into concrete a minimum of 7 inches (178 mm).*~~
~~*3.3. Anchors are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the track.*~~
~~*3.4. Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the track.*~~
~~*3.5. The track is 33 to 68 mil designation thickness.*~~

~~*Allowable in-plane shear strength of exempt anchors, parallel to the edge of concrete shall be permitted to be determined in accordance with AISI S100 Section E3.3.1.*~~

~~*4. In light-frame construction, design of anchors in concrete shall be permitted to satisfy D.3.3.8.*~~

~~*D.3.3.6 - Instead of D.3.3.5, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in D.3.3.4.*~~

~~***Exceptions:***~~

~~*1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.6.*~~
~~*2. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.6.*~~

~~*D.3.3.7 - As an alternative to D.3.3.5 and D.3.3.6, it shall be permitted to take the design strength of the anchors as 0.4 times the design strength determined in accordance with D.3.3.4.*~~
~~*D.3.3.8 – In light-frame construction, bearing or nonbearing walls, shear strength of concrete anchors less than or equal to 1 inch [25 mm] in diameter of sill plate or track to foundation or foundation stem wall need not satisfy D.3.3.7 when the design strength of the anchors is determined in accordance with D.6.2.1(c).*~~

~~**1905.1.10 ACI 318, Section D.4.2.2.** Delete ACI 318, Section D.4.2.2, and replace with the following:~~

~~*D.4.2.2 - The concrete breakout strength requirements for anchors in tension shall be considered satisfied by the design procedure of D.5.2 provided Equation D-7 is not used for anchor embedments exceeding 25 inches. The concrete breakout strength requirements for anchors in shear with diameters not exceeding 2 inches shall be considered satisfied by the design procedure of D.6.2. For anchors in shear with diameters exceeding 2 inches, shear anchor reinforcement shall be provided in accordance with the procedures of D.6.2.9.*~~

Reason: The purpose for this proposal is to update the 2012 IBC for consistency with ACI 318-11 and as explained below.

1. In IBC Section 1905.1.1, the definition of "wall pier" is deleted because of the definition of "wall pier" in Section 2.2 of ACI 318-11.
2. In IBC Section 1905.1.3, Sections 21.4.5 through 21.4.7 are deleted because of Section 21.4.4 of ACI 318-11, which reads: "In structures assigned to SDC D, E or F, wall piers shall be designed in accordance with 21.9 or 21.13."
3. IBC Section 1905.1.4 is deleted because of Section 21.9.8 of ACI 318-11, which specifies requirements for wall piers.
4. IBC Section 1905.1.9 is deleted because of Sections D.3.3.4 through D.3.5 of ACI 318-11, which specify seismic design requirements for anchors in structures that are substantially revised from the corresponding provisions in Sections D.3.3.3 through D.3.3.6 of ACI 318-08.
5. IBC Section 1905.1.10 is deleted because of Sections D.4.2.2 and D.4.3 of ACI 318-11, which specify requirements for concrete breakout strength and bond strength that are substantially revised from the corresponding provisions in Section D.4.2.2 of ACI 318-08.

Cost Impact: The code change proposal will not increase the cost of construction.

S202-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.1-S-BRAZIL.doc

S203–12
1905.1, 1905.1.1, 1905.1.3, 1905.1.4

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Revise as follows:

1905.1 General. The text of ACI 318 shall be modified as indicated in Sections 1905.1.1 through ~~1905.1.10~~ 1905.1.9.

~~***WALL PIER.*** *A wall segment with a horizontal length-tothickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.*~~

1905.1.3 ACI 318, Section 21.4. Modify ACI 318, Section 21.4, by adding new Section 21.4.3 and renumbering existing Section 21.4.3 to become 21.4.4. ~~and adding new Sections 21.4.3, 21.4.5, 21.4.6 and 21.4.7 to read as follows:~~

> *21.4.3 - Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.*
>
> 21.4.4 - Elements of the connection that are not designed to yield shall develop at least 1.5 $S_{y.}$
>
> ~~*21.4.5 - Wall piers in Seismic Design Category D, E or F shall comply with Section 1905.1.4 of the International Building Code.*~~
>
> ~~*21.4.6 - Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).*~~
>
> ~~***Exceptions:***~~
>
> 1. ~~*Wall piers that satisfy 21.13.*~~
> 2. ~~*Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*~~
>
> ~~*21.4.7 - Wall segments with a horizontal length-to thickness ratio less than 2.5 shall be designed as columns.*~~

~~**1905.1.4 ACI 318, Section 21.9.** Modify ACI 318, Section 21.9, by deleting Section 21.9.8 and replacing with the following:~~

> ~~*21.9.8 - Wall piers and wall segments.*~~
>
> ~~*21.9.8.1 - Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in 21.9.8.2.*~~
>
> ~~***Exceptions:***~~
>
> 1. ~~*Wall piers that satisfy 21.13.*~~
> 2. ~~*Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*~~

~~21.9.8.2 - Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces determined from 21.6.5.1. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).~~

~~21.9.8.3 - Wall segments with a horizontal length-to thickness ratio less than 2.5 shall be designed as columns.~~

Reason: This proposal removes the requirements for wall piers. Wall pier requirements are in 1905 because ACI 318-08 did not address the design of this component. ACI 318 incorporated wall pier design in the 2011 edition. Therefore, these amendments should now be removed.

Cost Impact: The code change proposal will not increase the cost of construction.

S203-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1-S-SENECAL

S204–12

1905.1, 1905.1.1, 1905.1.2 (NEW), 1905.1.2.1 (NEW), 1905.1.2.2 (NEW), 1905.1.2.3 (NEW), 1905.1.2.4 (NEW), 1905.1.2.5 (NEW), 1905.1.3.1 (NEW), 1905.1.3.2 (NEW), 1905.1.3.3 (NEW), 1905.1.3.4, 1905.1.3.5, 1905.1.4.1 (NEW), 1905.1.4.2 (NEW), 1905.1.4.3 (NEW), 1905.1.4.4, 1905.1.5.1

Proponent: Stephen V. Skalko, Portland Cement Association

Revise as follows:

SECTION 1905
~~MODIFICATIONS TO ACI 318~~ SEISMIC DESIGN OF STRUCTURAL CONCRETE

1905.1 General. ~~The text of~~ Concrete shall be designed and constructed in accordance with ACI 318 ~~shall be modified as indicated in~~ and Sections 1905.1.1 through 1905.1.10.

1905.1.1 ~~ACI 318, Section 2.2~~ Definitions. ~~Modify existing definitions and add the following definitions to ACI 318, Section 2.2.~~ The following definitions shall apply:

DESIGN DISPLACEMENT. Total lateral displacement expected for the design-basis earthquake, *as specified by Section 12.8.6 of ASCE 7.*

~~***DETAILED PLAIN CONCRETE STRUCTURAL WALL.*** *A wall complying with the requirements of Chapter 22, including 22.6.7.*~~

~~***ORDINARY PRECAST STRUCTURAL WALL.*** *A precast wall complying with the requirements of Chapters 1 through 18.*~~

~~**ORDINARY REINFORCED CONCRETE STRUCTURAL WALL.** A *cast-in-place* wall complying with the requirements of Chapters 1 through 18.~~

~~**ORDINARY STRUCTURAL PLAIN CONCRETE WALL.** A wall complying with the requirements of Chapter 22, *excluding 22.6.7*.~~

~~**SPECIAL STRUCTURAL WALL**. A cast-in-place or precast wall complying with the requirements of 21.1.3 through 21.1.7, 21.9 and 21.10, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls *or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural all."*~~

WALL PIER. *A wall segment with a horizontal length-to-thickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.*

1905.1.2 Structural concrete assemblies. Structural concrete assemblies described shall comply with the requirements of this Section.

1905.1.2.1 Detailed plain concrete structural wall. Detailed plain concrete structural walls shall comply with the requirements of ACI 318 Chapter 22 including Section 22.6.7, and the applicable requirements of Sections 1905.3 through 1905.11.

1905.1.2.2 Ordinary precast structural wall. -Ordinary precast structural walls shall comply with the requirements of ACI 318 Chapters 1 through 18 and the applicable requirements of Sections 1905.3 through 1905.11.

1905.1.2.3 Ordinary reinforced concrete structural wall. A cast-in-place ordinary reinforced concrete structural wall comply with the requirements of ACI 318 Chapters 1 through 18 and the applicable requirements of Sections 1905.3 through 1905.11.

1905.1.2.4 Ordinary structural plain concrete wall. Ordinary structural plain concrete walls shall comply with the requirements of ACI 318 Chapter 22, excluding 22.6.7 and the applicable requirement of Sections 1905.3 through 1905.11.

1905.1.2.5 Special structural wall. Special structural walls made of cast-in-place or precast concrete shall comply with the applicable requirements of ACI 318 Sections 21.1.3 through 21.1.7, 21.1.9, and 21.1.10 and Sections 1905.3 through 1905.11 and the requirements for ordinary reinforced concrete structural walls *or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural wall."*

~~**1905.1.2 ACI 318, Section 21.1.1 .** Modify ACI 318 Sections 21.1.1.3 and 21.1.1.7 to read as follows:~~
1905.1.3 Requirements for structures based on assigned Seismic Design Categories. The requirements of this section shall apply for the assigned Seismic Design Category.

1905.1.3.1 Provisions of ACI 318. The provisions of ACI 318 Sections 21.1.1.3 and Section 21.1.1.7 shall not apply.

~~*21.1.1.3 –*~~ **1905.1.3.2 Structures assigned to Seismic Design Category A.** Structures assigned to Seismic Design Category A shall satisfy requirements of ACI 318 Chapters 1 to 19 and 22 and the requirements of ACI *Chapter 21 ~~does~~ shall not apply*.

1905.1.3.3 Structures assigned to Seismic Design Category B, C, D, E or F. Structures assigned to *Seismic Design Category* B, C, D, E or F ~~also~~ shall satisfy 21.1.1.4 through 21.1.1.8, as applicable.

1905.1.3.4 Structural elements of plain concrete. ~~*Except for structural elements of plain concrete complying with Section 1905.1.8 of the International Building Code,*~~ *Structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.*

Exception: *Structural elements of plain concrete complying with Section 1905.1.9*

~~21.1.1.7 –~~ **1905.1.3.5 Seismic force resisting systems.** Structural systems designated as part of the seismic force-resisting system shall be restricted to those *permitted by ASCE 7*. ~~Except for *Seismic Design Category* A, for which Chapter 21 does not apply,~~ The following provisions shall be satisfied for each structural system designated as part of the seismic force-resisting system for structures assigned to~~,~~ ~~regardless of the~~ *Seismic Design Category* B, C, D, E or F:

(a) Ordinary moment frames shall satisfy ACI 318 Section 21.2.
(b) Ordinary reinforced concrete structural walls *and ordinary precast structural walls* need not satisfy any provisions in ACI 318 Chapter 21.
(c) Intermediate moment frames shall satisfy ACI 318 Section 21.3.
(d) Intermediate precast *structural* walls shall satisfy ACI Section 21.4.
(e) Special moment frames shall satisfy ACI 318 Section 21.5 through 21.8.
(f) Special structural walls shall satisfy ACI 318 Section 21.9.
(g) Special structural walls constructed using precast concrete shall satisfy ACI 318 Section 21.10.

All special moment frames and special structural walls shall also satisfy ACI 318 Section 21.1.3 through 21.1.7.

~~**1905.1.3 ACI 318, Section 21.4.** Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5, 21.4.6 and 21.4.7 to read as follows:~~

1905.1.4 Connections. Connections shall comply with the requirements of ACI 318 Section 21.4 and the following requirements:

~~*21.4.3 –*~~ **1905.1.4.1 Connections designed to yield.** *Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.*

~~21.4.4 - Elements of the connection that are not designed to yield shall develop at least 1.5 S_y. *21.4.5 –*~~

1905.1.4.2 Wall piers in Seismic Design Category D, E, or F. *Wall piers in Seismic Design Category D, E or F shall comply with Section ~~1905.1.4~~* 1905.1.5 *~~of the International Building Code~~.*

~~*21.4.6 –*~~ **1905.1.4.3 Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C.** *Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from ACI 318 Section 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).*

Exceptions:

1. *Wall piers that satisfy ACI 318 Section 21.13.*
2. *Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*

~~*21.4.7 –*~~ **1905.1.4.4 Wall segments.** *Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.*

~~**1905.1.4 ACI 318, Section 21.9.** Modify ACI 318, Section 21.9, by deleting Section 21.9.8 and replacing with the following:~~ **1905.1.5 Special structural walls and coupling beams.** Wall piers and wall segments in special structural walls shall comply with Section 1905.1.5.1.

~~*21.9.8 -*~~ **1905.1.5.1 Wall piers and wall segments.**

~~*21.9.8.1 –*~~ *a. Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in ACI 318 Section 21.9.8.2.*

Exceptions:

1. *Wall piers that satisfy ACI 318 Section 21.13.*
2. *Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*

~~*21.9.8.2 –*~~ *b. Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces determined from ACI 318 Section 21.6.5.1. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).*
~~*21.9.8.3*~~ *c. Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.*

~~**1905.1.5 ACI 318, Section 21.10.** Modify ACI 318, Section 21.10.2, to read as follows:~~ **1905.1.6 Special structural walls constructed using precast.** In addition to Section 21.10.2 of ACI 318 special structural walls constructed using precast concrete shall satisfy ~~all the requirements of 21.9 for cast-in-place special structural walls in addition to Sections 21.4.2 *through* 21.4.4~~ Section 1905.1.4.1.

~~**1905.1.6 ACI 318, Section 21.12.1.1.** Modify ACI 318, Section 21.12.1.1, to read as follows:~~
~~21.12.1.1 - Foundations resisting earthquake-induced forces or transferring earthquake-induced forces between a structure and ground shall comply with the~~

<u>**1905.1.7 Foundations.** The requirements of this section shall apply for foundations resisting earthquake-induced forces or transferring earthquake-inducted forces between a structure and ground.</u>

<u>a.</u> <u>The requirements of ACI 318 Section 21.12.1.1 shall not apply.</u>
<u>b.</u> <u>The</u> requirements of <u>ACI 318</u> Section 21.12 and other applicable provisions of ACI 318 *unless modified by Chapter 18 of the International Building Code.*

~~**1905.1.7 ACI 318, Section 22.6.** Modify ACI 318, Section 22.6, by adding new Section 22.6.7 to read as follows:~~

~~22.6.7 - Detailed plain concrete structural walls.~~
~~22.6.7.1 - Detailed plain concrete structural walls are walls conforming to the requirements of ordinary structural plain concrete walls and 22.6.7.2.~~
~~22.6.7.2 -~~ <u>**1905.1.8 Detailed plain structural concrete walls.**</u> *<u>For detailed plain structural concrete wall</u> reinforcement shall be provided as follows:*

(a) <u>**1905.1.8.2 Vertical reinforcement.**</u> *Vertical reinforcement of at least 0.20 square inch (129 mm2) in cross-sectional area shall be provided continuously from support to support at each corner, at each side of each opening and at the ends of walls. The continuous vertical bar required beside an opening is permitted to substitute for one of the two No. 5 bars required by <u>ACI 318 Section</u> 22.6.6.5.*

~~(b)~~ <u>**1905.1.8.2 Horizontal reinforcement.**</u> *Horizontal reinforcement at least 0.20 square inch (129 mm2) in cross-sectional area shall be provided:*

1. *Continuously at structurally connected roof and floor levels and at the top of walls;*
2. *At the bottom of load-bearing walls or in the top of foundations where doweled to the wall; and*
3. *At a maximum spacing of 120 inches (3048 mm).*

Reinforcement at the top and bottom of openings, where used in determining the maximum spacing specified in Item 3 above, shall be continuous in the wall.

~~**1905.1.8 ACI 318, Section 22.10.** Delete ACI 318, Section 22.10, and replace with the following:~~

~~22.10 –~~ <u>**1905.1.9 Plain concrete in earthquake-resisting structures.**</u> *<u>The requirements of this Section shall apply to</u> plain concrete in structures assigned to Seismic Design Category C, D, E or F.*
<u>(a) The requirements of ACI 318 Section 22.10 shall not apply.</u>
~~22.10.1~~ <u>(b)</u> Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

~~(a)~~ <u>1.</u> Structural plain concrete basement, foundation or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with studbearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the thickness shall not be less than 71/2 inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.
~~(b)~~ <u>2.</u> Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.

__Exception:__ In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.

~~(c)~~ 3. Plain concrete footings supporting walls are permitted, provided the footings have at least two continuous longitudinal reinforcing bars.
c. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing.
d. For footings that exceed 8 inches (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.

Exceptions:

1. *In Seismic Design Categories A, B and C, detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls, are permitted to have plain concrete footings without longitudinal reinforcement.*
2. *For foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one bar shall be provided at the top of the stemwall and at the bottom of the footing.*
3. Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.

~~**1905.1.9 ACI 318, Section D.3.3.** Delete ACI 318 Sections D.3.3.4 through D.3.3.7 and replace with the following:~~

~~*D.3.3.4 –*~~ **1905.10 Seismic design for anchoring to concrete.** Requirements for seismic design of anchorage to concrete shall comply with this Section.

(a). The requirements of ACI 318 Sections D3.3.4 through D3.3.7 shall not apply.
(b). The anchor design strength associated with concrete failure modes shall be taken as 0.75∅Nn and 0.75∅Vn, where ∅ is given in D4.3 or D4.4 and Nn and Vn are deteremined in accordance with ACI 318 Sections D5.2, D5.3, D5.4, D6.2 and D6.3, assuming the concrete is cracked unless it can be demonstrated that the concrete remains uncracked.
(c). D.3.3.5 - Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with ACI 318 Sections D.5.1 and D.6.1, unless either D.3.3.6 or D.3.3.7 is satisfied.

Exceptions:

1. *Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy ACI 318* Section D.3.3.5.
2. *ACI 318 Section D.3.3.5 need not apply and the design shear strength in accordance with ACI Section D.6.2.1(c) need not be computed for anchor bolts attaching wood sill plates of bearing or non-bearing walls of light-frame wood structures to foundations or foundation stem walls provided all of the following are satisfied:*
   2.1. The allowable in-plane shear strength of the anchor is determined in accordance with AF&PA NDS Table 11E for lateral design values parallel to grain.
   2.2 The maximum anchor nominal diameter is 5/8 inches (16 mm).
   2.3. Anchor bolts are embedded into concrete a minimum of 7 inches (178 mm).
   2.4. Anchor bolts are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the wood sill plate.
   2.5. Anchor bolts are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate.
   2.6. The sill plate is 2-inch or 3-inch nominal thickness.

3. *ACI 318 Section D.3.3.5 need not apply and the design shear strength in accordance with ACI 318 Section D.6.2.1(c) need not be computed for anchor bolts attaching cold-formed steel track of bearing or non-bearing walls of light-frame construction to foundations or foundation stem walls provided all of the following are satisfied:*
   3.1. The maximum anchor nominal diameter is 5/8 inches (16 mm).
   3.2. Anchors are embedded into concrete a minimum of 7 inches (178 mm).
   3.3. Anchors are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the track.
   3.4. Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the track.
   3.5. The track is 33 to 68 mil designation thickness.

Allowable in-plane shear strength of exempt anchors, parallel to the edge of concrete shall be permitted to be determined in accordance with AISI S100 Section E3.3.1.

4. *In light-frame construction, design of anchors in concrete shall be permitted to satisfy Section 1905.1.1(f) ~~D.3.3.8~~.*

~~D.3.3.6 –~~(d). Instead of ~~D.3.3.5~~ the requirements in Section 1905.1.10(c), the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in Section 1905.1.10 (b).~~D.3.3.4.~~

Exceptions:

1. *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section ~~D.3.3.6~~ 1905.1.10(d).*
2. *Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section ~~D.3.3.6~~ 1905.1.10(d).*

~~D.3.3.7 –~~ (e). As an alternative to ~~D.3.3.5 and D.3.3.6~~ Sections 1905.1.10(c) and (d), it shall be permitted to take the design strength of the anchors as 0.4 times the design strength determined in accordance with ~~D.3.3.4~~ Section 1905.1.10(b).
~~D.3.3.8 –~~ (f.) In light-frame construction, bearing or nonbearing walls, shear strength of concrete anchors less than or equal to 1 inch [25 mm] in diameter of sill plate or track to foundation or foundation stem wall need not satisfy D.3.3.7 when the design strength of the anchors is determined in accordance with D.6.2.1(c).

~~**1905.1.10 ACI 318, Section D.4.2.2.** Delete ACI 318, Section D.4.2.2, and replace with the following:~~

~~D.4.2.2 –~~ **1905.1.11 Anchors with diameters less than 4 in.**

(a). The requirements of ACI 318 Section D4.2.2. shall not apply.
(b)..The concrete breakout strength requirements for anchors in tension shall be considered satisfied by the design procedure of ACI 318 Section D.5.2 provided ACI 318 Equation D-7 is not used for anchor embedments exceeding 25 inches. The concrete breakout strength requirements for anchors in shear with diameters not exceeding 2 inches shall be considered satisfied by the design procedure of ACI 318 Section D.6.2. For anchors in shear with diameters exceeding 2 inches, shear anchor reinforcement shall be provided in accordance with the procedures of ACI 318 Section D.6.2.9.

Reason: There are three main reasons in support of this code change intended as modifications of Chapter 19 "Concrete" of the *International Building Code* (IBC):

1. The proposal removes redundancies in definitions of ACI 318. Such redundancies are not necessary and may be detrimental in that they may cause confusion and result in errors. The introductory section of Chapter 19, "1901.2 Plain and reinforced concrete" adequately and appropriately requires compliance with ACI 318.

2. It is more appropriate to display several definitions in Section 1905.1.1 as code requirements instead of definitions. The language within these definitions contain specific criteria which should be stated as code requirements. These have been revised accordingly.
3. It is inappropriate to modify the provisions of ACI 318 within the body of the IBC. If one wishes to revise provisions of ACI 318 the changes should be submitted to the ACI process. If the provisions contained within Section 1905 are in addition to ACI 318 then they should be worded as such. This proposal makes these revisions to the IBC to reflect these additional requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

S204-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1-S-SKALKO.doc

S205–12
1905.1.3, 1905.1.4, 1905.1.5

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (skerr@jwa-se.com)

Revise as follow:

1905.1.3 ACI 318, Section 21.4. Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5, 21.4.6 and 21.4.7 to read as follows:

21.4.3 - Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

21.4.4 - Elements of the connection that are not designed to yield shall develop at least 1.5 *Sy*.

21.4.5 - Wall piers in Seismic Design Category D, E or F shall comply with ~~Section 1905.1.4 of the International Building Code~~ ACI 318 Section 21.9.9.

21.4.6 - Wall piers not designed as part of a moment frame in buildings assigned to Seismic Design Category C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

Exceptions:

1. *Wall piers that satisfy 21.13.*
2. *Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*

21.4.7 - Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

~~**1905.1.4 ACI 318, Section 21.9.** Modify ACI 318, Section 21.9, by deleting Section 21.9.8 and replacing with the following:~~

~~*21.9.8 - Wall piers and wall segments.*~~

~~*21.9.8.1 - Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in 21.9.8.2.*~~

~~***Exceptions:***~~

1. ~~*Wall piers that satisfy 21.13.*~~
2. ~~*Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*~~

~~*21.9.8.2 - Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces determined from 21.6.5.1. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).*~~

~~*21.9.8.3 - Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.*~~

~~**1905.1.5 ACI 318, Section 21.10.** Modify ACI 318, Section 21.10.2, to read as follows:~~
~~21.10.2 - Special structural walls constructed using precast concrete shall satisfy all the requirements of 21.9 for cast-in-place special structural walls in addition to Sections 21.4.2 *through* 21.4.4.~~

Reason: The purpose of this proposal is to align the IBC Chapter 19 modifications of ACI 318 with the new version of ACI 318.

1905.1.3: ACI 318 Section 21.9.9 is a new section written for wall piers in buildings assigned to SDC D, E or F. This proposal will mandate the requirement of wall pier detailing requirement in the lower SDCs which has been in the Code since 2000.

1905.1.4: Reason: ACI 318 Section 21.9.9 is a new section written for wall piers in buildings assigned to SDC D, E or F. Requirement in this section is no longer needed.

1905.1.5: This requirement is now included under ACI 318-11 section 21.9.1., the requirement in this section is no longer needed.

Cost Impact: The code change proposal will not increase the cost of construction.

S205-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.3-S-KERR.doc

S206–12
1905.1.8

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Delete and substitute as follows:

~~**1905.1.8 ACI 318, Section 22.10.** Delete ACI 318, Section 22.10, and replace with the following:~~

~~*22.10 - Plain concrete in structures assigned to Seismic Design Category C, D, E or F.*~~

~~*22.10.1 - Structures assigned to Seismic Design CategoyC, D, E or F shall not have elements of structural plain concrete, except as follows:*~~

~~*(a) Structural plain concrete basement, foundation or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with studbearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the thickness shall not be less than 71/2 inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.*~~
~~*(b) Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.*~~

~~***Exception:** In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.*~~

~~*(c) Plain concrete footings supporting walls are permitted, provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. For footings that exceed 8 inches (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.*~~

~~***Exceptions:***~~

1. ~~*In Seismic Design Categories A, B and C, detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls, are permitted to have plain concrete footings without longitudinal reinforcement.*~~
2. ~~*For foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one bar shall be provided at the top of the stemwall and at the bottom of the footing.*~~
3. ~~*Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.*~~

1905.1.8 ACI 318, Section 22.10. The requirements of Section 22.10 shall apply for plain concrete in earthquake-resisting structures assigned to Seismic Design Category C, D, E, or F.

Reason: The only substantive difference provided in this revision to ACI 318 is the inclusion of SDC C. The remaining text provides a few detailing changes that are based on engineering practice, not design principles. It is therefore recommended to remove such changes, and retain the inclusion for plain concrete in structures assigned to SDC C.
Discussion:
22.10 is an editorial revision to the heading in ACI 318 which reads, “Plain concrete in earthquake-resisting structures.” This revision is unnecessary.

22.10.1.(a) above is similar to 22.10.1.(c) in ACI 318. The IBC provision limits the height of the wall to 8 ft, which is a practical limit. The design requirements of 22.6 in ACI 318 take wall height into account. Therefore, the height limit is unnecessary.

22.10.1.(b) above is similar to 22.10.1.(a) in ACI 318. The IBC provision limits the projection of the footing where ACI 318 limits the use of plain concrete. Removing this exception results in a slightly more conservative design.

22.10.1.(c) above is similar to 22.10.1.(b) in ACI 318. The IBC provision provides direction on where to place reinforcement, which is a detailing practice. Removing this exception results in no design change.

Cost Impact: The code change proposal will not increase the cost of construction.

S206-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.8-S-SENECAL

S207–12
1905.1.9

Proponent: Kevin Moore, Certus Consulting, Inc. (NCSEA, NIBS, BSSC, CRSC), representing NCSEA Seismic Subcommittee

Delete and substitute as follows:

~~**1905.1.9 ACI 318, Section D.3.3.**~~

1905.1.9 ACI 318, Section D.3.3.5.3 Modify ACI 318, Section D.3.3.5.3, by adding the following: exceptions:

D.3.3.5.3 — Anchors and their attachments shall be designed using one of options (a) through (c):

(a) The anchor or group of anchors shall be designed for the maximum shear that can be transmitted to the anchor or group of anchors based on the development of a ductile yield mechanism in the attachment in flexure, shear, or bearing, or a combination of those conditions, and considering both material overstrength and strain hardening effects in the attachment.
(b) The anchor or group of anchors shall be designed for the maximum shear that can be transmitted to the anchors by a non-yielding attachment.
(c) The anchor or group of anchors shall be designed for the maximum shear obtained from design load combinations that include E, with E increased by Ωo. The anchor design shear strength shall satisfy the shear strength requirements of D.4.1.1.

Exceptions:

1. *Per option D.3.3.5.3 (b), anchor or group of anchor shear strength design need not be computed per D.6.2 or D.6.3 for anchor bolts attaching wood sill plates of bearing or nonbearing walls of light-frame wood structures to foundations or foundation stem walls provided all of the following are satisfied:*
   - *1.1. The allowable in-plane shear strength of the anchor is determined in accordance with AF&PA NDS Table 11E for lateral design values parallel to grain.*
   - *1.2. The maximum anchor nominal diameter is 5/8 inches (16 mm).*
   - *1.3. Anchor bolts are embedded into concrete a minimum of 7 inches (178 mm).*
   - *1.4. Anchor bolts are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the wood sill plate.*
   - *1.5. Anchor bolts are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate.*
   - *1.6. The sill plate is of 2-inch or 3-inch nominal thickness.*
2. *Per option D.3.3.5.3 (b), anchor or group of anchor shear strength design need not be computed per D.6.2 or D.6.3 for anchor bolts attaching cold-formed steel track of bearing or nonbearing walls of light-frame construction to foundations or foundation stem walls provided all of the following are satisfied: 2.2. Anchors are embedded into concrete a minimum of 7 inches (178 mm).*
   - *2.3. Anchors are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the track.*
   - *2.4. Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the track.*
   - *2.5. The track is 33 to 68 mil designation thickness.*

Allowable in-plane shear strength of exempt anchors, parallel to the edge of concrete shall be permitted to be determined in accordance with AISI S100 Section E3.3.1.

Reason: As currently written in the 2012 IBC, Section 1905.1.9, Section D.3.3 does not align with the section numbering of ACI 318-11, Appendix D. This editorial revision realigns the ACI 318-11 language with primary exceptions for light frame construction sill plates, since they remain relevant.

Please note that the following exceptions were not brought forward: Exception 1 of D.3.3.5 and Exception 2 of D3.3.6 on anchors designed to resist wall out-of-plane forces; Exception 1 of D3.3.6 on anchors designed to support nonstructural components; and, Exception 4 of D.3.3.5 on light-frame construction. The applicability of Exception 1 of D.3.3.5, Exception 4 of D.3.3.5, Exception 1 of D3.3.6 and, Exception 2 of D3.3.6 applied to ACI 318-11, Appendix D could not be verified. Proponents of these exceptions are encouraged to re-evaluate them based upon provisions of ACI 318-11, Appendix D and bring forward public comments as appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

S207-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.9-S-MOORE.doc

S208–12
1905.1.9

Proponent: Stephen Kerr, S.E. Josephson Werdowatz and Associates, representing Structural Engineers Association of California (skerr@jwa-se.com)

Revise as follows:

1905.1.9 ACI 318, Section D.3.3. ~~Delete ACI 318 Sections D.3.3.4 through D.3.3.7 and replace with the following~~ Modify ACI Section D.3.3.5.3 as follows:

~~*D.3.3.4 - The anchor design strength associated with concrete failure modes shall be taken as 0.75ϕN*~~$_n$ ~~*and 0.75ϕV*~~$_n$~~*, where ϕ is given in D4.3 or D4.4 and N*~~$_n$ ~~*and V*~~$_n$ ~~*are deteremined in accordance with D5.2, D5.3, D5.4, D6.2 and D6.3, assuming the concrete is cracked unless it can be demonstrated that the concrete remains uncracked.*~~

~~*D.3.3.5*~~ *D.3.3.5.3 - Anchors and their attachments shall be designed to be governed* ~~*by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.6 or D.3.3.7 is satisfied.*~~ *using one of options (a) through (f):*

(a) The anchor or group of anchors shall have ϕV_n not less than the maximum force that can be transmitted to the anchor or group of anchors based on the development of a ductile yield mechanism in the attachment in flexure, shear, or bearing, or a combination of those conditions, and considering both material overstrength and strain hardening effects in the attachment.
(b) The anchor or group of anchors shall have ϕV_n not less than the maximum shear that can be transmitted to the anchors by a non-yielding attachment.
(c) The anchor or group of anchors shall have ϕV_n not less than the maximum shear obtained from design load combinations that include E, with E increased by Ω_0. The anchor design shear strength shall satisfy the shear strength requirements of D.4.1.1.

~~***Exceptions:***~~

~~*1. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy* Section D.3.3.5.~~

(d)~~2.~~ ~~D.3.3.5~~ D3.3.5.3 need not apply and the design shear strength in accordance with D.6.2.1(c) need not be computed for anchor bolts attaching wood sill plates of bearing or non-bearing walls of light-frame wood structures to foundations or foundation stem walls provided all of the following are satisfied:

- ~~*2.1.*~~ *1. The allowable in-plane shear strength of the anchor is determined in accordance with AF&PA NDS Table 11E for lateral design values parallel to grain.*
- ~~*2.2*~~ *2. The maximum anchor nominal diameter is 5/8 inches (16 mm).*
- ~~*2.3.*~~ *3. Anchor bolts are embedded into concrete a minimum of 7 inches (178 mm).*
- ~~*2.4.*~~ *4. Anchor bolts are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the wood sill plate.*
- ~~*2.5.*~~*5. Anchor bolts are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate.*
- ~~*2.6.*~~ *6. The sill plate is 2-inch or 3-inch nominal thickness.*

(e)~~*3.*~~ *Section D.*~~*3.3.5*~~ *3.3.5.3 need not apply and the design shear strength in accordance with Section D.6.2.1(c) need not be computed for anchor bolts attaching cold-formed steel track*

of bearing or non-bearing walls of light-frame construction to foundations or foundation stem walls provided all of the following are satisfied:

~~*3.1.*~~ *1.* *The maximum anchor nominal diameter is 5/8 inches (16 mm).*
~~*3.2.*~~ *2.* *Anchors are embedded into concrete a minimum of 7 inches (178 mm).*
~~*3.3.*~~ *3.* *Anchors are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the track.*
~~*3.4.*~~ *4.* *Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the track.*
~~*3.5.*~~ *5.* *The track is 33 to 68 mil designation thickness.*
6. *Allowable in-plane shear strength of exempt anchors, parallel to the edge of concrete shall be permitted to be determined in accordance with AISI S100 Section E3.3.1.*

~~*4. In light-frame construction, design of anchors in concrete shall be permitted to satisfy D.3.3.8.*~~

~~*D.3.3.6 - Instead of D.3.3.5, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in D.3.3.4.*~~

~~***Exceptions:***~~

~~*1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.6.*~~
~~*2. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.6.*~~

~~*D.3.3.7 - As an alternative to D.3.3.5 and D.3.3.6, it shall be permitted to take the design strength of the anchors as 0.4 times the design strength determined in accordance with D.3.3.4.*~~

~~*D.3.3.8 –*~~ *(f) In light-frame construction, bearing or nonbearing walls, shear strength of concrete anchors less than or equal to 1 inch [25 mm] in diameter of sill plate or track to foundation or foundation stem wall need not satisfy* ~~*D.3.3.7*~~ *D.3.3.5.3 (a) through (c) when the design strength of the anchors is determined in accordance with D.6.2.1(c).*

Reason: ACI 318-11 has made major modification to Appendix D. This proposed modification to section 1905.1.9 intends to maintain the well thought-out design provisions for sill bolts with minimum edge distance introduced into IBC 2012.

Cost Impact: The code change proposal will not increase the cost of construction.

S208-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.9-S-KERR.doc

S209–12
1905.1.9, 1905.1.10

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Revise as follows:

1905.1.9 ACI 318, Section D.3.3. ~~Delete~~ Modify ACI 318 Section~~s D.3.3.4 through D3.3.7 and replace~~ D.3.3.5 by adding D.3.3.5.5 ~~with the following~~ as follows:

> ~~*D.3.3.4 - The anchor design strength associated with concrete failure modes shall be taken as 0.75∅ Nn and 0.75∅ Vn, where ∅ is given in D4.3 or D4.4 and Nn and Vn are deteremined in accordance with D5.2, D5.3, D5.4, D6.2 and D6.3, assuming the concrete is cracked unless it can be demonstrated that the concrete remains uncracked.*~~
>
> ~~*D.3.3.5 - Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.6 or D.3.3.7 is satisfied.*~~
>
> ~~***Exceptions:***~~
>
> ~~*1.*~~ ~~*Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy*~~ ~~Section D.3.3.5.~~

D.3.3.5.5 – For shear parallel to an edge, the following exceptions are permitted:

~~*2.*~~ *(a).* ~~*D.3.3.5 need not apply and the design shear strength in accordance with*~~ *D.6.2.1(c) need not be computed for anchor bolts attaching wood sill plates of bearing or non-bearing walls of light-frame wood structures to foundations or foundation stem walls provided all of the following are satisfied:*

- ~~*2.1.*~~ *1. The allowable in-plane shear strength of the anchor is determined in accordance with AF&PA NDS Table 11E for lateral design values parallel to grain.*
- ~~*2.2*~~ *2. The maximum anchor nominal diameter is 5/8 inches (16 mm).*
- ~~*2.3.*~~ *3. Anchor bolts are embedded into concrete a minimum of 7 inches (178 mm).*
- ~~*2.4.*~~ *4. Anchor bolts are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the wood sill plate.*
- ~~*2.5.*~~ *5. Anchor bolts are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate.*
- ~~*2.6.*~~ *6. The sill plate is 2-inch or 3-inch nominal thickness.*

~~*3.*~~ *(b). Section D.3.3.5 need not apply and the design shear strength in accordance with Section D.6.2.1(c) need not be computed for anchor bolts attaching cold-formed steel track of bearing or non-bearing walls of light-frame construction to foundations or foundation stem walls provided all of the following are satisfied:*

- ~~*3.1.*~~ *1. The maximum anchor nominal diameter is 5/8 inches (16 mm).*
- ~~*3.2.*~~ *2. Anchors are embedded into concrete a minimum of 7 inches (178 mm).*
- ~~*3.3.*~~ *3. Anchors are located a minimum of 13/4 inches (45 mm) from the edge of the concrete parallel to the length of the track.*
- ~~*3.4.*~~ *4. Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the track.*
- ~~*3.5.*~~ *5. The track is 33 to 68 mil designation thickness.*

Allowable in-plane shear strength of exempt anchors, parallel to the edge of concrete shall be permitted to be determined in accordance with AISI S100 Section E3.3.1.

~~*4 In light-frame construction, design of anchors in concrete shall be permitted to satisfy D.3.3.8.*~~

~~*D.3.3.6 - Instead of D.3.3.5, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in D.3.3.4.*~~

~~***Exceptions:***~~

1. ~~*Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.6.*~~
2. ~~*Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.6.*~~

~~*D.3.3.7 - As an alternative to D.3.3.5 and D.3.3.6, it shall be permitted to take the design strength of the anchors as 0.4 times the design strength determined in accordance with D.3.3.4.*~~
~~*D.3.3.8 – In light-frame construction, bearing or nonbearing walls, shear strength of concrete anchors less than or equal to 1 inch [25 mm] in diameter of sill plate or track to foundation or foundation stem wall need not satisfy D.3.3.7 when the design strength of the anchors is determined in accordance with D.6.2.1(c).*~~

~~**1905.1.10 ACI 318, Section D.4.2.2.** Delete ACI 318, Section D.4.2.2, and replace with the following:~~

~~*D.4.2.2 - The concrete breakout strength requirements for anchors in tension shall be considered satisfied by the design procedure of D.5.2 provided Equation D-7 is not used for anchor embedments exceeding 25 inches. The concrete breakout strength requirements for anchors in shear with diameters not exceeding 2 inches shall be considered satisfied by the design procedure of D.6.2. For anchors in shear with diameters exceeding 2 inches, shear anchor reinforcement shall be provided in accordance with the procedures of D.6.2.9.*~~

Reason: Appendix D had numerous changes in ACI 318-11, but the code change proposal process is ahead of the administrative update process in which ACI 318-11 was approved. Therefore, the exceptions to the 2012 IBC were based on ACI 318-08.

In the 2012 IBC, all of the changes to the ACI 318-11 seismic anchor provisions were deleted and the ACI 318-08 provisions were inserted with exceptions. ACI does not understand how this change occurred because this was not agreed to at the hearings.

This code change proposal synchronizes IBC with ACI 318-11.

1905.1.9:

- Remove D.3.3.4 and D.3.3.5: These provisions were copied from ACI 318-08.
- Remove Exception 1 to D.3.3.5: Anchors with loads increased by Ω_o do not need to meet the requirements of D.3.3 as allowed in D.3.3.4.3(d) for tension and D3.3.5.3.(c) for shear in ACI 318-11.
- Revise Exceptions 2, 3, and 4 to D.3.3.5: There is no longer a 0.75 reduction for shear in seismic nor does the anchor need to, "be designed to be governed by the steel strength of a ductile steel element," for shear. These exceptions may be removed, but the exceptions as written do not require a concrete failure check according to D.6.2.1(c). Therefore, keep the items as exceptions for shear.
- Remove Exception 4 to D.3.3.5: There is no longer a 0.75 reduction for shear in seismic nor does the anchor need to "be designed to be governed by the steel strength of a ductile steel element" for shear.
- Remove D.3.3.6: This provision was copied from ACI 318-08.
- Remove Exception 1 and 2 to D.3.3.6: Anchors with loads increased by Ω_o do not need to meet the requirements of D.3.3 as allowed in D.3.3.4.3.(d) for tension and D3.3.5.3.(c) for shear in ACI 318-11.
- Remove D.3.3.7: This provision was copied from ACI 318-08.
- Revise D.3.3.8: See note about Exception 4 to D.3.3.5 above.

1905.1.10: This modification was made in the 2009 IBC in anticipation that ACI 318 was going to increase the limits. In ACI 318-11, the limitation on length was removed and the maximum diameter of the anchor was increased to 4 in. Therefore, the modification may now be removed.

Cost Impact: The code change proposal will not increase the cost of construction.

S209-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.9-S-SENECAL

S210–12
1905.1.10 (NEW)

Proponent: Bonnie Manley, American Iron and Steel Institute (bmanley@steel.org)

Add new text as follows:

1905.1.10 ACI 318, Section D.3.3.4.4. Modify ACI 318, Section D.3.3.4.4 by adding the following exception:

D.3.3.4.4 — The anchor design tensile strength for resisting earthquake forces shall be determined from consideration of (a) through (e) for the failure modes given in Table D.4.1.1 assuming the concrete is cracked unless it can be demonstrated that the concrete remains uncracked:

(a) φN_{sa} for a single anchor, or for the most highly stressed individual anchor in a group of anchors;
(b) $0.75\varphi N_{cb}$ or $0.75\varphi N_{cbg}$, except that N_{cb} or N_{cbg} need not be calculated where anchor reinforcement satisfying D.5.2.9 is provided;
(c) $0.75\varphi N_{pn}$ for a single anchor, or for the most highly stressed individual anchor in a group of anchors;
(d) $0.75\varphi N_{sb}$ or $0.75\varphi N_{sbg}$; and
(e) $0.75\varphi N_a$ or $0.75\varphi N_{ag}$

where φ is in accordance with D.4.3 or D.4.4.

Exception:

1. *The anchor design strength need not be reduced by the 0.75 factor for anchors in structural steel seismic force resisting systems designed in accordance with Section 2205, with the following restrictions:*

   a. *Anchor rod has a minimum diameter of 3/4".*
   b. *Anchor rod has a minimum embedment of 12".*
   c. *Concrete foundation elements receiving the anchor rods have the minimum reinforcement required in accordance with ACI 318, Chapters 7 and 10 located within the upper half of the embedment depth of the anchor rods.*

Reason: Section D2.6 of AISC 341-10 prescribes column anchorage required strengths based upon the maximum required strength of the structural steel members delivering the load to the anchorage. These forces are elevated to ensure that the column base has adequate strength to permit the expected ductile behavior for which the system was designed in order for the expected performance to be achieved. In recognition of these elevated design forces, the 0.75 strength reduction factor is redundant and not deemed necessary for cast-in-place anchors, since these anchors have performed well in past earthquakes. Conservatively, this exception is limited to cast-in-place anchors with a minimum diameter of 3/4", a minimum concrete embedment of 12", and minimum reinforcement for temperature and shrinkage crack control.

Cost Impact: The code change proposal will reduce the cost of construction.

S210-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1905.1.10 (NEW)-S-MANLEY.doc

S211–12
1906.1

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Delete without substitution:

~~**1906.1 Scope.** The design and construction of structural plain concrete, both cast-in-place and precast, shall comply with the minimum requirements of ACI 318, as modified in Section 1905.~~

> ~~**Exception:** For Group R-3 occupancies and buildings of other occupancies less than two stories above grade plane of light-frame construction, the required footing thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall.~~

Reason: This proposal removes the exception to the minimum footing thickness required in 22.7.4 in ACI 318-11. The exception reduces the minimum footing thickness from 8 in. to 6 in. The requirement for 8 in. has been in the ACI 318 code since 1941. The requirement for a 6 in. thickness has been in various model codes for a variety of exceptions over the past 40 to 50 years.

Recommend that the IBC accept the ACI 318 limit.

Cost Impact: The code change proposal will increase the cost of construction.

S211-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1906.1-S-SENECAL

S212–12
1901.2, 1901.3 (NEW), 1907

Proponent: Matthew Senecal, P.E., representing American Concrete Institute (ACI)

Revise as follows:

1901.2 ~~Plain and reinforced~~ Structural concrete. Plain and reinforced structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code. ~~Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical loads or lateral forces from other parts of the structure to the soil.~~

1901.3 Nonstructural concrete. Plain and reinforced nonstructural concrete shall be designed and constructed in accordance with the durability requirements of 1904. The thickness of slabs on ground supported directly on the ground shall not be less than 3.5 inches (89 mm).

Delete without substitution:

~~**SECTION 1907 MINIMUM SLAB PROVISIONS**~~

~~**1907.1 General.** The thickness of concrete floor slabs supported directly on the ground shall not be less than 31/2 inches (89 mm). A 6-mil (0.006 inch; 0.15 mm) polyethylene vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the base course or subgrade and the concrete floor slab, or other *approved* equivalent methods or materials shall be used to retard vapor transmission through the floor slab.~~

~~**Exception:** A vapor retarder is not required:~~

1. ~~For detached structures accessory to occupancies in Group R-3, such as garages, utility buildings or other unheated facilities.~~
2. ~~For unheated storage rooms having an area of less than 70 square feet (6.5 m2) and carports attached to occupancies in Group R-3.~~
3. ~~For buildings of other occupancies where migration of moisture through the slab from below will not be detrimental to the intended occupancy of the building.~~
4. ~~For driveways, walks, patios and other flatwork which will not be enclosed at a later date.~~
5. ~~Where *approved* based on local site conditions.~~

Reason: This code change proposal (1) removes a repetitive requirement given in ACI 318, (2) removes vapor barrier as a default requirement, and (3) condenses the remaining code requirements into a single provision.

(1) Repetitive requirement: Section 1.1.7 in ACI 318-11 states the following:

> "This Code does not govern design and construction of slabs-on-ground, unless the slab transmits vertical loads or lateral forces from other portions of the structure to the soil."

In 1901.2, the phrase "the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical loads or lateral forces from other parts of the structure to the soil" simply repeats the intent of ACI 318, 1.1.7.

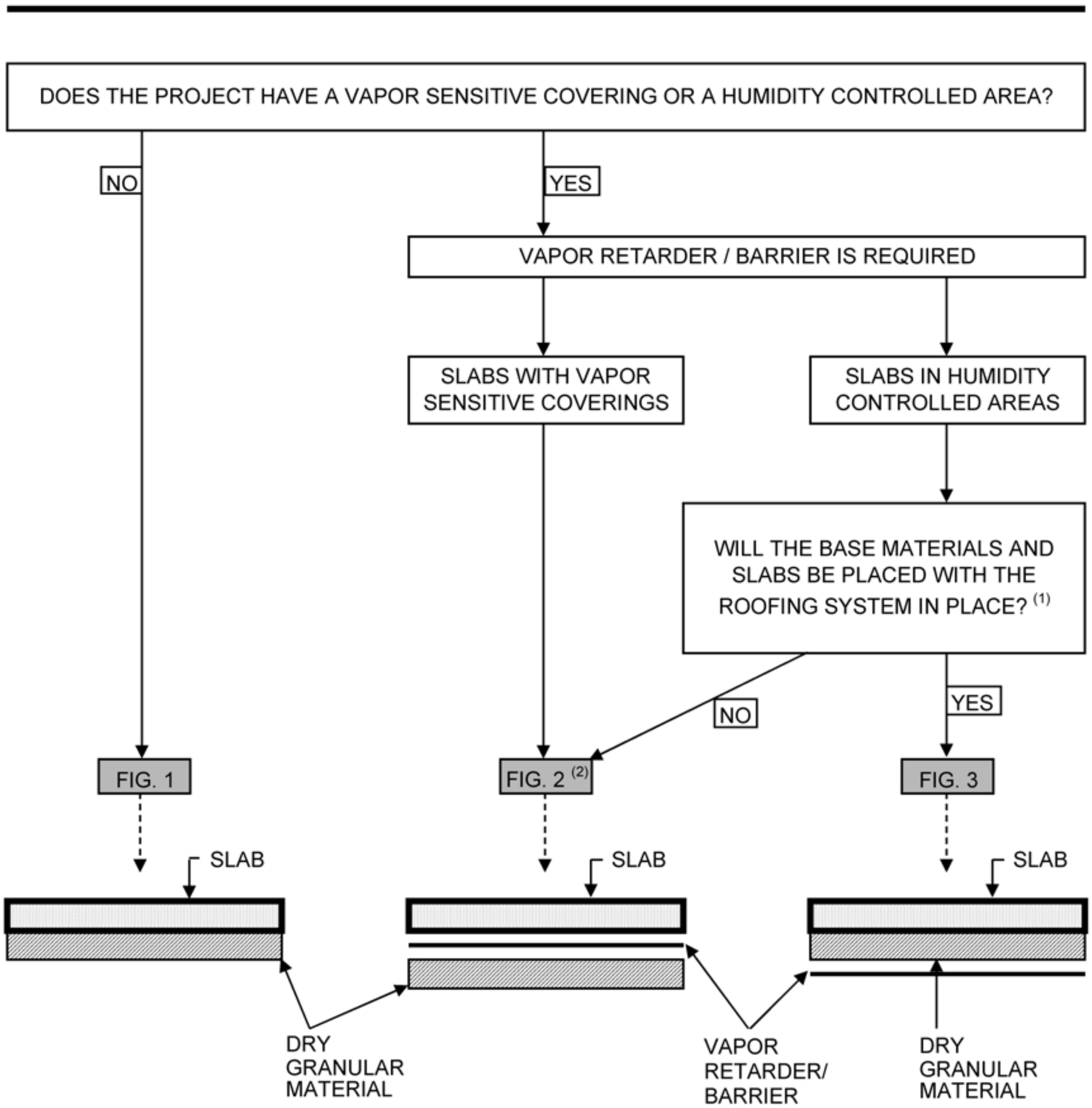
(2) Vapor barrier: Requiring the vapor retarder to be directly under the slab is not always the best design. ACI 302.1R-04, Concrete Floor and Slab Construction, states the following related to concerns for placing concrete directly on a vapor retarder:

> "Placing concrete in direct contact with the vapor retarder or barrier, however, requires additional consideration if potential slab-related problems are to be avoided. When compared with identical concrete cast on a draining base, concrete placed in direct contact with a vapor retarder or barrier has been shown to exhibit significantly larger length change in the first hour after casting, during drying shrinkage, and when subject to environmental change; there is also more settlement (Suprenant 1997). Care should be taken in design detailing to minimize restraint to such movement (Anderson and Roper 1977). Where reinforcing steel is present, settlement cracking over the steel is more likely because of the increased settlement resulting from a longer bleeding period. The potential for a greater measure of slab curl is also increased."

Figure 3.1 from ACI 302.1R-04 (below) is a flow chart that describes when and where to place a vapor retarder.

Therefore, it is proposed to remove the requirement that, in all cases, a vapor barrier be placed between the base course or subgrade and the concrete floor slab. The Registered Design Professional should be given the responsibility to determine the need and location of the vapor retarder.

Fig. 3.1 – DECISION FLOW CHART TO DETERMINE IF A VAPOR RETARDER / BARRIER IS REQUIRED AND WHERE IT IS TO BE PLACED



NOTES:

(1) IF GRANULAR MATERIAL IS SUBJECT TO FUTURE MOISTURE INFILTRATION, USE FIG. 2.
(2) IF FIGURE 2 IS USED, A REDUCED JOINT SPACING, A LOW SHRINKAGE MIX DESIGN, OR OTHER MEASURES TO MINIMIZE SLAB CURL WILL LIKELY BE REQUIRED.

(3) One code provision: If the two deletions are accepted above, the slab requirements may be reduced to an exception in 1901.2.

Cost Impact: The code change proposal will not increase the cost of construction.

S212-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1901.2-S-SENECAL

S213–12
Table 1705.3, 1908, 1908.1, 1908.2, Table 1908.2, 1908.3, 1908.4, 1908.5

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Revise as follows:

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
3. Inspection of anchors cast in concrete~~ where allowable loads have been increased or where strength design is used~~.	—	X	ACI 318: 8.1.3, 21.2.8	~~1908.5,~~ 1909.1

(Portions of Table not shown remain unchanged)

Delete without substitution:

~~**SECTION 1908 ANCHORAGE TO CONCRETE—ALLOWABLE STRESS DESIGN**~~

~~**1908.1 Scope.** The provisions of this section shall govern the *allowable stress design* of headed bolts and headed stud anchors cast in normal-weight concrete for purposes of transmitting structural loads from one connected element to the other. These provisions do not apply to anchors installed in hardened concrete or where load combinations include earthquake loads or effects. The bearing area of headed anchors shall be not less than one and one-half times the shank area. Where strength design is used, or where load combinations include earthquake loads or effects, the design strength of anchors shall be determined in accordance with Section 1909. Bolts shall conform to ASTM A 307 or an *approved* equivalent.~~

~~**1908.2 Allowable service load.** The allowable service load for headed anchors in shear or tension shall be as indicated in Table 1908.2. Where anchors are subject to combined shear and tension, the following relationship shall be satisfied:~~

~~$(P_s / P_t)^{5/3} + (V_s / V_t)^{5/3} \leq 1$ **(Equation 19-1)**~~

~~where:~~

~~*Ps* = Applied tension service load, pounds (N).~~
~~*Pt* = Allowable tension service load from Table 1908.2, pounds (N).~~
~~*Vs* = Applied shear service load, pounds (N).~~
~~*Vt* = Allowable shear service load from Table 1908.2, pounds (N).~~

~~**TABLE 1908.2**~~
~~**ALLOWABLE SERVICE LOAD ON EMBEDDED BOLTS (pounds)**~~

~~BOLT DIAMETER (inches)~~	~~MINIMUM EMBEDMENT (inches)~~	~~EDGE DISTANCE (inches)~~	~~SPACING (inches)~~	~~MINIMUM CONCRETE STRENGTH (psi)~~					
				~~f_c' = 2,500~~		~~f_c' = 3,000~~		~~f_c' = 4,000~~	
				~~Tension~~	~~Shear~~	~~Tension~~	~~Shear~~	~~Tension~~	~~Shear~~
~~1/4~~	~~2-1/2~~	~~1-1/2~~	~~3~~	~~200~~	~~500~~	~~200~~	~~500~~	~~200~~	~~500~~
~~3/8~~	~~3~~	~~2-1/4~~	~~4-1/2~~	~~500~~	~~1,100~~	~~500~~	~~1,100~~	~~500~~	~~1,100~~
~~1/2~~	~~4~~ ~~4~~	~~3~~ ~~5~~	~~6~~ ~~6~~	~~950~~ ~~1,450~~	~~1,250~~ ~~1,600~~	~~950~~ ~~1,500~~	~~1,250~~ ~~1,650~~	~~950~~ ~~1,550~~	~~1,250~~ ~~1,750~~

~~BOLT DIAMETER (inches)~~	~~MINIMUM EMBEDMENT (inches)~~	~~EDGE DISTANCE (inches)~~	~~SPACING (inches)~~	~~MINIMUM CONCRETE STRENGTH (psi)~~					
				~~f_c' = 2,500~~		~~f_c' = 3,000~~		~~f_c' = 4,000~~	
				~~Tension~~	~~Shear~~	~~Tension~~	~~Shear~~	~~Tension~~	~~Shear~~
~~5/8~~	~~4-1/2~~ ~~4-1/2~~	~~3-3/4~~ ~~6-1/4~~	~~7-1/2~~ ~~7-1/2~~	~~1,500~~ ~~2,125~~	~~2,750~~ ~~2,950~~	~~1,500~~ ~~2,200~~	~~2,750~~ ~~3,000~~	~~1,500~~ ~~2,400~~	~~2,750~~ ~~3,050~~
~~3/4~~	~~5~~ ~~5~~	~~4-1/2~~ ~~7-1/2~~	~~9~~ ~~9~~	~~2,250~~ ~~2,825~~	~~3,250~~ ~~4,275~~	~~2,250~~ ~~2,950~~	~~3,560~~ ~~4,300~~	~~2,250~~ ~~3,200~~	~~3,560~~ ~~4,400~~
~~7/8~~	~~6~~	~~5-1/4~~	~~10-1/2~~	~~2,550~~	~~3,700~~	~~2,550~~	~~4,050~~	~~2,550~~	~~4,050~~
~~1~~	~~7~~	~~6~~	~~12~~	~~3,050~~	~~4,125~~	~~3,250~~	~~4,500~~	~~3,650~~	~~5,300~~
~~1-1/8~~	~~8~~	~~6-3/4~~	~~13-1/2~~	~~3,400~~	~~4,750~~	~~3,400~~	~~4,750~~	~~3,400~~	~~4,750~~
~~1-1/4~~	~~9~~	~~7-1/2~~	~~15~~	~~4,000~~	~~5,800~~	~~4,000~~	~~5,800~~	~~4,000~~	~~5,800~~

~~**1908.3 Required edge distance and spacing.** The allowable service loads in tension and shear specified in Table 1908.2 are for the edge distance and spacing specified. The edge distance and spacing are permitted to be reduced to 50 percent of the values specified with an equal reduction in allowable service load. Where edge distance and spacing are reduced less than 50 percent, the allowable service load shall be determined by linear interpolation.~~

~~**1908.4 Increase in allowable load.** Increase of the values in Table 1908.2 by one-third is permitted where the provisions of Section 1605.3.2 permit an increase in allowable stress for wind loading.~~

~~**1908.5 Increase for special inspection.** Where *special inspection* is provided for the installation of anchors, a 100- percent increase in the allowable tension values of Table 1908.2 is permitted. No increase in shear value is permitted.~~

Reason: This proposal removes allowable stress design for anchoring to concrete. This approach to anchor design is not consistent with the standards published by ACI, AISC, or ASCE

Cost Impact: The code change proposal will not increase the cost of construction.

S213-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1908-S-SENECAL

S214–12
1908, 1909

Proponent: Stephen V. Skalko, Portland Cement Association

Delete without substitution:

~~SECTION 1908~~
~~ANCHORAGE TO CONCRETE—ALLOWABLE STRESS DESIGN~~

~~1908.1 Scope.~~

~~1908.2 Allowable service load.~~

~~1908.3 Required edge distance and spacing.~~

~~1908.4 Increase in allowable load.~~

~~1908.5 Increase for special inspection.~~

~~SECTION 1909~~
~~ANCHORAGE TO CONCRETE—STRENGTH DESIGN~~

~~1909.1 Scope.~~

Reason: There are three main reasons in support of this code change to modify Chapter 19 "Concrete" of the *International Building Code* (IBC):

1. The proposal removes redundancies for anchorage between ACI 318 and the IBC. Such redundancies are not necessary and may be detrimental in that they may cause confusion and result in errors. The introductory section of Chapter 19, "1901.2 Plain and reinforced concrete" adequately and appropriately requires compliance with ACI 318.
2. ACI 318 addresses the criteria for anchorage in a more complete approach. Sections 1908 and 1909 instruct the user that when allowable stress design or strength design are used for anchorage to concrete the other criteria and requirements in ACI 318 are no longer required, including but not limited to break out and types and amount of anchor reinforcement.
3. If the chapters and sections in whatever edition of ACI 318 that becomes referenced in the 2015 edition of the IBC are not properly coordinated, there will be confusion and will increase the potential for errors in design and construction.

Cost Impact: The code change proposal will not increase the cost of construction.

S214-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1908-S-SKALKO.doc

S215–12
Table 1705.3, 1901.3 (NEW), 1909

Proponent: Matthew Senecal, P.E, American Concrete Institute (ACI)

Revise as follows:

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
3. Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used.	—	X	ACI 318: D.9.2 ~~8.1.3, 21.1.8~~	1908.5, ~~1909.1~~
4. Inspection of anchors post-installed in hardened concrete members[b] ~~.~~:	~~—~~	~~X~~	~~ACI 318: 3.8.6, 8.1.3, 21.1.8~~	~~1909.1~~
a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads	X		ACI 318: D.9.2.4	—
b. Mechanical anchors and adhesive anchors not defined in 4.a.		X	ACI 318: D.9.2	—

b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with ~~ACI 355.2~~ D.9.2 in ACI 318, or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

(Portions of table not shown remain unchanged)

1901.3 Anchoring to concrete. Anchoring to concrete shall be in accordance with ACI 318 as amended in Section 1905, and applies to cast-in (headed bolts, headed studs, and hooked J- or L-bolts) anchors and post-installed expansion (torque-controlled and displacement-controlled), undercut, and adhesive anchors.

Delete without substitution:

~~SECTION 1909~~
~~ANCHORAGE TO CONCRETE—STRENGTH DESIGN~~

~~**1909.1 Scope.** The provisions of this section shall govern the strength design of anchors installed in concrete for purposes of transmitting structural loads from one connected element to the other. Headed bolts, headed studs and hooked (J- or L-) bolts cast in concrete and expansion anchors and undercut anchors installed in hardened concrete shall be designed in accordance with Appendix D of ACI 318 as modified by Sections 1905.1.9 and 1905.1.10, provided they are within the scope of Appendix D.~~

~~The strength design of anchors that are not within the scope of Appendix D of ACI 318, and as amended in Sections 1905.1.9 and 1905.1.10, shall be in accordance with an *approved* procedure.~~

Reason: Requirements for the design and installation of adhesive anchors was included in ACI 318-11. Requirements for continuous inspection were added for adhesive anchors installed horizontally or in upwardly inclined orientations with sustained loads.

The difficulty of installing adhesive anchors greatly increases when gravity works to drain the placed epoxy out of the predrilled hole. For consistent installation, trained personnel are essential.

Under sustained tension loads, epoxy will creep and debond as evidenced by the epoxy anchors that supported the ceiling panels in the I-90 connector tunnel in Boston. A proper installation is critical in this case and requires continuous inspection.

In the interest of writing concise code language, recommend deleting this section 1909 and providing a general requirement just after 1901.2, “Plain and reinforced concrete.”

Cost Impact: The code change proposal will not increase the cost of construction.

S215-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1909-S-SENECAL

S216–12

Table 1705.3, 1901.2.1 (NEW), 1910, 1910.1, 1910.2, 1910.3, 1910.4, 1910.5, 1910.6, 1910.7, 1910.8, 1910.9, 1910.9.1, 1910.9.2, 1910.9.3, 1910.10, 1910.11, 1910.12, 1910.13

Proponent: Matthew Senecal, P.E., American Concrete Association (ACI) and Christopher Darnell, American Shotcrete Association

Revise as follows:

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1-7.7	~~1910.4~~
5. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2-5.4	1904.2~~, 1910.2, 1910.3~~
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	~~1910.10~~
7. Inspection of concrete ~~and shotcrete~~ placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	~~1910.6, 1910.7, 1910.8~~
8. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11-5.13	~~1910.9~~

(Portions of table not shown remain unchanged)

1901.2.1 Shotcrete. Shotcrete is mortar or concrete that is pneumatically projected at high velocity onto a surface. Shotcrete shall conform to the requirements of this chapter for plain or reinforced concrete, as applicable.

Delete without substitution:

~~**SECTION 1910**~~
~~**SHOTCRETE**~~

~~**1910.1 General.** Shotcrete is mortar or concrete that is pneumatically projected at high velocity onto a surface. Except as specified in this section, shotcrete shall conform to the requirements of this chapter for plain or reinforced concrete.~~

~~**1910.2 Proportions and materials.** Shotcrete proportions shall be selected that allow suitable placement procedures using the delivery equipment selected and shall result in finished in-place hardened shotcrete meeting the strength requirements of this code.~~

~~**1910.3 Aggregate.** Coarse aggregate, if used, shall not exceed 3/4 inch (19.1 mm).~~

~~**1910.4 Reinforcement.** Reinforcement used in shotcrete construction shall comply with the provisions of Sections 1910.4.1 through 1910.4.4.~~

~~**1910.4.1 Size.** The maximum size of reinforcement shall be No. 5 bars unless it is demonstrated by preconstruction tests that adequate encasement of larger bars will be achieved.~~

~~**1910.4.2 Clearance.** When No. 5 or smaller bars are used, there shall be a minimum clearance between parallel reinforcement bars of 21/2 inches (64 mm). When bars larger than No. 5 are permitted, there shall be a minimum clearance between parallel bars equal to six diameters of the bars used. When two curtains of steel are provided, the curtain nearer the nozzle shall have a minimum spacing equal to 12 bar diameters and the remaining curtain shall have a minimum spacing of six bar diameters.~~

> ~~**Exception:** Subject to the approval of the *building official*, required clearances shall be reduced where it is demonstrated by preconstruction tests that adequate encasement of the bars used in the design will be achieved.~~

~~**1910.4.3 Splices.** Lap splices of reinforcing bars shall utilize the noncontact lap splice method with a minimum clearance of 2 inches (51 mm) between bars. The use of contact lap splices necessary for support of the reinforcing is permitted when *approved* by the *building official*, based on satisfactory preconstruction tests that show that adequate encasement of the bars will be achieved, and provided that the splice is oriented so that a plane through the center of the spliced bars is perpendicular to the surface of the shotcrete.~~

~~**1910.4.4 Spirally tied columns.** Shotcrete shall not be applied to spirally tied columns.~~

~~**1910.5 Preconstruction tests.** When required by the *building official*, a test panel shall be shot, cured, cored or sawn, examined and tested prior to commencement of the project. The sample panel shall be representative of the project and simulate job conditions as closely as possible. The panel thickness and reinforcing shall reproduce the thickest and most congested area specified in the structural design. It shall be shot at the same angle, using the same nozzleman and with the same concrete mix design that will be used on the project. The equipment used in preconstruction testing shall be the same equipment used in the work requiring such testing, unless substitute equipment is *approved* by the *building official*.~~

~~**1910.6 Rebound.** Any rebound or accumulated loose aggregate shall be removed from the surfaces to be covered prior to placing the initial or any succeeding layers of shotcrete. Rebound shall not be used as aggregate.~~

~~**1910.7 Joints.** Except where permitted herein, unfinished work shall not be allowed to stand for more than 30 minutes unless edges are sloped to a thin edge. For structural elements that will be under compression and for construction joints shown on the *approved construction documents*, square joints are permitted. Before placing additional material adjacent to previously applied work, sloping and square edges shall be cleaned and wetted.~~

~~**1910.8 Damage.** In-place shotcrete that exhibits sags, sloughs, segregation, honeycombing, sand pockets or other obvious defects shall be removed and replaced. Shotcrete above sags and sloughs shall be removed and replaced while still plastic.~~

~~**1910.9 Curing.** During the curing periods specified herein, shotcrete shall be maintained above 40°F (4°C) and in moist condition.~~

~~**1910.9.1 Initial curing.** Shotcrete shall be kept continuously moist for 24 hours after shotcreting is complete or shall be sealed with an *approved* curing compound.~~

~~**1910.9.2 Final curing.** Final curing shall continue for seven days after shotcreting, or for three days if highearly-strength cement is used, or until the specified strength is obtained. Final curing shall consist of the initial curing process or the shotcrete shall be covered with an *approved* moisture-retaining cover.~~

~~**1910.9.3 Natural curing.** Natural curing shall not be used in lieu of that specified in this section unless the relative humidity remains at or above 85 percent, and is authorized by the *registered design professional* and *approved* by the *building official*.~~

~~**1910.10 Strength tests.** Strength tests for shotcrete shall be made by an *approved agency* on specimens that are representative of the work and which have been water soaked for at least 24 hours prior to testing. When the maximum-size aggregate is larger than 3/8 inch (9.5 mm), specimens shall consist of not less than three 3-inch-diameter (76 mm) cores or 3-inch (76 mm) cubes. When the maximum-size aggregate is 3/8 inch (9.5 mm) or smaller, specimens shall consist of not less than 2-inch-diameter (51 mm) cores or 2-inch (51 mm) cubes.~~

~~**1910.10.1 Sampling.** Specimens shall be taken from the in-place work or from test panels, and shall be taken at least once each shift, but not less than one for each 50 cubic yards (38.2 m3) of shotcrete.~~

~~**1910.10.2 Panel criteria.** When the maximum-size aggregate is larger than 3/8 inch (9.5 mm), the test panels shall have minimum dimensions of 18 inches by 18 inches (457 mm by 457 mm). When the maximum size aggregate is 3/8 inch (9.5 mm) or smaller, the test panels shall have minimum dimensions of 12 inches by 12 inches (305 mm by 305 mm). Panels shall be shot in the same position as the work, during the course of the work and by the nozzlemen doing the work. The conditions under which the panels are cured shall be the same as the work.~~

~~**1910.10.3 Acceptance criteria.** The average compressive strength of three cores from the in-place work or a single test panel shall equal or exceed 0.85 f'_c with no single core less than 0.75 f_c'. The average compressive strength of three cubes taken from the in-place work or a single test panel shall equal or exceed f_c' with no individual cube less than 0.88 f_c'. To check accuracy, locations represented by erratic core or cube strengths shall be retested.~~

Reason: Shotcrete is a concrete placement method that is specified by a registered design professional in a set of contract documents. ACI 318 covers the essential information necessary for the design and construction of concrete structures using shotcrete. The requirements currently in the IBC are outdated construction specifications.

ACI 506.2, Specification for Shotcrete, provides a detailed set of construction requirements that represents the current standard of practice. The specification contains quality assurance requirements, 35 referenced standard test methods and material specifications, placement requirements, and acceptance criteria. ACI 506.2 is not being submitted as a reference standard since construction specifications should not be in the building code.

Cost Impact: The code change proposal will not increase the cost of construction.

S216-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1910-S-SENECAL

S217–12
1911, 2501.1.1, 2514 (NEW)

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI) and Michael Gardner, Gypsum Association

Revise as follows:

SECTION ~~1911~~ 2514 REINFORCED GYPSUM CONCRETE

~~1911.1~~ 2514.1 General. Reinforced gypsum concrete shall comply with the requirements of ASTM C 317 and ASTM C 956.

~~1911.2~~ 2514.2 Minimum thickness. The minimum thickness of reinforced gypsum concrete shall be 2 inches (51 mm) except the minimum required thickness shall be reduced to 11/2 inches (38 mm), provided the following conditions are satisfied:

1. The overall thickness, including the formboard, is not less than 2 inches (51 mm).
2. The clear span of the gypsum concrete between supports does not exceed 33 inches (838 mm).
3. Diaphragm action is not required.
4. The design live load does not exceed 40 pounds per square foot (psf) (1915 Pa).

2501.1.1 General. Provisions of this chapter shall govern the materials, design, construction and quality of gypsum board, lath, gypsum plaster ~~and~~ cement plaster, and reinforced gypsum concrete.

Reason: The design and construction of gypsum concrete roof decks and slabs are governed by ASTM C317 and ASTM C956. The product is gypsum-based and maintained by the ASTM C 11 Gypsum Products group; thus, making it more appropriate for inclusion in Chapter 25.

Cost Impact: The code change proposal will not increase the cost of construction.

S217-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1911-S-SENECAL

S218–12
1901.3 (NEW), 1912

Proponent: Matthew Senecal, P.E., American Concrete Institute (ACI)

Revise as follows:

1901.3 Composite structural steel and concrete structures. Systems of structural steel acting compositely with reinforced concrete shall be designed in accordance with Section 2206 of this code.

~~**SECTION 1912 CONCRETE-FILLED PIPE COLUMNS**~~

~~**1912.1 General.** Concrete-filled pipe columns shall be manufactured from standard, extra-strong or double-extra-strong steel pipe or tubing that is filled with concrete so placed and manipulated as to secure maximum density and to ensure complete filling of the pipe without voids.~~

~~**1912.2 Design.** The safe supporting capacity of concrete filled pipe columns shall be computed in accordance with the *approved* rules or as determined by a test.~~

~~**1912.3 Connections**. Caps, base plates and connections shall be of *approved* types and shall be positively attached to the shell and anchored to the concrete core. Welding of brackets without mechanical anchorage shall be prohibited. Where the pipe is slotted to accommodate webs of brackets or other connections, the integrity of the shell shall be restored by welding to ensure hooping action of the composite section.~~

~~**1912.4 Reinforcement.** To increase the safe load-supporting capacity of concrete-filled pipe columns, the steel reinforcement shall be in the form of rods, structural shapes or pipe embedded in the concrete core with sufficient clearance to ensure the composite action of the section, but not nearer than 1 inch (25 mm) to the exterior steel shell. Structural shapes used as reinforcement shall be milled to ensure bearing on cap and base plates.~~

~~**1912.5 Fire-resistance-rating protection.** Pipe columns shall be of such size or so protected as to develop the required fire-resistance ratings specified in Table 601. Where an outer steel shell is used to enclose the fire protective covering, the shell shall not be included in the calculations for strength of the column section. The minimum diameter of pipe columns shall be 4 inches (102 mm) except that in structures of Type V construction not exceeding three *stories above grade plane* or 40 feet (12 192 mm) in *building height*, pipe columns used in basements and as secondary steel members shall have a minimum diameter of 3 inches (76 mm).~~

~~**1912.6 Approvals.** Details of column connections and splices shall be shop fabricated by *approved* methods and shall be *approved* only after tests in accordance with the *approved* rules. Shop-fabricated concrete-filled pipe columns shall be inspected by the *building official* or by an *approved* representative of the manufacturer at the plant.~~

Reason: The design and construction of concrete-filled pipe columns is covered in the reference standards stated in 2206 of this code. The requirements above are not complete nor have they been maintained. Recommend adding a general statement that directs the user to the appropriate section.

Cost Impact: The code change proposal will not increase the cost of construction.

S218-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1912-S-SENECAL

S219–12
202, 2101.2, 2101.2.1, 2101.2.2, 2101.2.3, 2101.2.4, 2101.2.5, 2101.2.7, 2101.3, 2101.3.1, 2102.1, 2111.2

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org), Phil Samblanet, Masonry Alliance for Codes and Standards, representing The Masonry Society (psamblanet@masonrysociety.org)

Delete without substitution:

SECTION 202
DEFINITIONS

~~**ANCHOR.** Metal rod, wire or strap that secures *masonry* to its structural support.~~

Revise as follows:

2101.2 Design methods. Masonry shall comply with the provisions of ~~one of the following design methods in this chapter~~ TMS 402/ACI 530/ASCE 5 or TMS 403 as well as the ~~requirements of Sections 2101 through 2104. Masonry designed by the *allowable stress design* provisions of Section 2101.2.1, the strength design provisions of Section 2101.2.2, the prestressed masonry provisions of Section 2101.2.3, or the direct design requirements of Section 2101.2.7 shall comply with Section 2105~~ applicable requirements of this chapter.

~~**2101.2.1 Allowable stress design.** Masonry designed by the *allowable stress design* method shall comply with the provisions of Sections 2106 and 2107.~~

~~**2101.2.2 Strength design.** Masonry designed by the strength design method shall comply with the provisions of Sections 2106 and 2108, except that autoclaved aerated concrete (AAC) masonry shall comply with the provisions of Section 2106 and Chapter 1 and Appendix A of TMS 402/ACI 530/ASCE 5.~~

~~**2101.2.3 Prestressed masonry.** Prestressed masonry shall be designed in accordance with Chapters 1 and 4 of TMS 402/ACI 530/ASCE 5 and Section 2106. *Special inspection* during construction shall be provided as set forth in Section 1705.4.~~

~~**2101.2.4 Empirical design.** Masonry designed by the empirical design method shall comply with the provisions of Sections 2106 and 2109 or Chapter 5 of TMS 402/ACI 530/ASCE 5.~~

~~**2101.2.5 Glass unit masonry.** Glass unit masonry shall comply with the provisions of Section 2110 or Chapter 7 of TMS 402/ACI 530/ASCE 5.~~

~~**2101.2.6**~~ **2101.2.1 Masonry veneer.** Masonry veneer shall comply with the provisions of Chapter 14 ~~or Chapter 6 of TMS 402/ACI 530/ASCE 5~~.

~~**2101.2.7 Direct design.** Masonry designed by the direct design method shall comply with the provisions of TMS 403.~~

~~**2101.3 Construction documents.** The *construction documents* shall show all of the items required by this code including the following:~~

1. ~~Specified size, grade, type and location of reinforcement, anchors and wall ties.~~
2. ~~Reinforcing bars to be welded and welding procedure.~~
3. ~~Size and location of structural elements.~~
4. ~~Provisions for dimensional changes resulting from elastic deformation, creep, shrinkage, temperature and moisture.~~

5. ~~Loads used in the design of masonry.~~
6. ~~Specified compressive strength of masonry at stated ages or stages of construction for which masonry is designed, except where specifically exempted by this code.~~
7. ~~Details of anchorage of masonry to structural members, frames and other construction, including the type, size and location of connectors.~~
8. ~~Size and permitted location of conduits, pipes and sleeves.~~
9. ~~The minimum level of testing and inspection as defined in Chapter 17, or an itemized testing and inspection program that meets or exceeds the requirements of Chapter 17.~~

2101.3 Special Inspection. The special inspection of masonry shall be as defined in Chapter 17, or an itemized testing and inspection program shall be provided that meets or exceeds the requirements of Chapter 17.

~~2101.3.1~~ 2111.2 Fireplace drawings. The *construction documents* shall describe in sufficient detail the location, size and construction of masonry fireplaces. The thickness and characteristics of materials and the clearances from walls, partitions and ceilings shall be indicated.

2102.1 General. For the purposes of this chapter and as used elsewhere in this code, the following terms are defined in Chapter 2:

~~ANCHOR.~~

Reason: Section 2101 provides a series of pointers to specific sections of the IBC as well as the referenced masonry standards that, due largely to the evolution of Chapter 21 over time, has become a source of confusion. In addition, the 2013 edition of TMS 402 standard has been substantially reorganized to be more user friendly; requiring in turn that a number of the Chapters and Sections referenced in TMS 402 be updated. Instead of updating these pointers, this change proposal simply consolidates the charging language of Section 2101. No technical change is intended or implied. Specific discussion related to this change:
1) The reference to Chapter 14 for masonry veneers is maintained as Chapter 14 addresses some types of masonry veneer not covered by the reference standard (for example, anchored stone veneer). Chapter 14 already contains a reference to Chapter 6 of the reference standard.
2) The construction document requirements of Section 2101.3 are virtually identical to the requirements of Section 1.2.2 of TMS 402 and are therefore proposed to be deleted.
3) Although somewhat redundant, a reference to Chapter 17 for special inspection is maintained as a new Section 2101.3 to reinforce compliance with these requirements.
4) Section 2101.3.1 for fireplace drawings is relocated to Section 2111.2, which covers requirements specific to fireplaces.
5) While the term anchor (or anchorage) is used generically throughout the IBC for all types of building materials, this term (as applied specifically to masonry construction) is used only in Section 2101.3, which is proposed for deletion. As such, the IBC definition is proposed for deletion as well. The definition of 'anchor' in TMS 402 is identical to the IBC definition.

Cost Impact: The code change proposal will not increase the cost of construction.

S219-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2101-S-SAMBLANET-THOMPSON.doc

S220–12
202

Proponent: Phillip Brazil, P.E., S.E., Reid Middleton, Inc., representing self (pbrazil@reidmiddleton.com)

Revise as follows:

CLEANOUT <u>(for Chapter 21)</u>. An opening to the bottom of a grout space of sufficient size and spacing to allow the removal of debris.

DIMENSIONS <u>(for Chapter 21)</u>.

> **Nominal.** The *specified* dimension plus an allowance for the *joints* with which the units are to be laid. Nominal dimensions are usually stated in whole numbers. Thickness is given first, followed by height and then length.
> **Specified.** Dimensions specified for the manufacture or construction of a unit, *joint* <u>or</u> element.

~~**EXISTING CONSTRUCTION.** Any buildings and structures for which the *start of construction* commenced before the effective date of the community's first flood plain management code, ordinance or standard. "Existing construction" is also referred to as "existing structures."~~

~~**EXISTING STRUCTURE (For Section 1612.2).** See "Existing construction".~~

FOUNDATION PIER <u>(for Chapter 21)</u>. An isolated vertical foundation member whose horizontal dimension measured at right angles to its thickness does not exceed three times its thickness and whose height is equal to or less than four times its thickness.

OTHER STRUCTURES <u>(for Chapters 16-23)</u>. Structures, other than buildings, for which *loads* are specified in Chapter 16.

WALL <u>(for Chapter 21)</u>. A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space.

> **Cavity wall.** A wall built of *masonry units* or of concrete, or a combination of these materials, arranged to provide an airspace within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.
> **Composite wall.** A wall built of a combination of two or more *masonry units* bonded together, one forming the backup and the other forming the facing elements.
> **Dry-stacked, surface-bonded wall.** A wall built of concrete *masonry units* where the units are stacked dry, without *mortar* on the bed or *head joints*, and where both sides of the wall are coated with a surface-bonding *mortar*.
> **Masonry-bonded hollow wall.** A multi-*wythe* wall built of *masonry units* arranged to provide an air space between the *wythes* and with the *wythes* bonded together with *masonry units.*
> **Parapet wall.** The part of any wall entirely above the roof line.

Reason: The purpose for this proposal is to adjust the definitions in Section 202 to (1) clarify their purpose and (2) to correct errors from approved changes in previous ICC code development cycles that were not made in the building code.

Adding "for Chapter 21" to the definitions of "cleanout," "dimensions," "foundation pier" and "wall" is done to reduce their applicability to what is their intended purpose, namely the structural provisions for masonry in Chapter 21. The terms are sufficiently common in use to justify this action and will make them consistent with the definitions of "area," "cell," "shear wall" and "strength," which are identified in a similar manner.

Adding "for Chapter 21" to the definition of "wall" is also done because of ICC Proposal FS85-07/08-AS, Part II, which added to Section 2102.1 after the definition of "wall" the following: "The definition of 'wall' is limited in application to the provisions of Chapter 21." I was the proponent of this proposal and I requested that this be posted as errata but a posting did not occur nor was the language incorporated into later printings of the 2009 IBC or into the 2012 IBC.

The definitions of "existing construction" and "existing structure" are being deleted because they serve no purpose in the building code. There are no instances of "existing construction" in the 2012 IBC other than as shown in this proposal. There are numerous instances of “existing structure” in the 2012 IBC but there are none in Section 1612 and the definition of “existing structure” is limited to that section as specified in Section 202.

The addition of “for Chapters 16-23” to the definition of “other structures” is because of the use of the term in other sections of the building code (e.g., Sections 402.6.2, 424.3 and 3102.1). The source document for the term is ASCE 7 and it was in 2009 IBC Section 1602.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S220-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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S221–12

2103.15 (NEW), 2103.15.1 (NEW), 2103.15.2 (NEW), 2103.15.3 (NEW), 2104.5 (NEW), Chapter 35 (NEW)

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, *Products in Fibre-reinforced Cement*

Add new text as follows:

2103.15 Fiber-cement backer board and underlayment. Fiber-cement backer board and underlayment shall conform to the requirements of Section 2103.15.1, 2103.15.2, or 2103.15.3, and shall be so identified on labeling listing an approved quality control agency.

2103.15.1 Fiber-cement backer board. Fiber-cement backer board complying with either ASTM C1288 or ISO 8336, Category B or C, is a suitable *backing* for decoration with paint, wallpaper, resilient flooring, tile, natural stone, or dimensioned stone *veneer* on floors, walls, and ceilings in interior dry areas; and for interior use in wet areas of walls and ceilings as permitted in Section 2509.2.

2103.15.2 Fiber-cement underlayment. Fiber-cement underlayment complying with either ASTM C1288 or ISO 8336, Category B or C, is a suitable *backing* for decoration with resilient flooring, tile, natural stone, or dimensioned stone *veneer* in interior wet or dry areas.

2103.15.3 Fiber-cement backer board. Fiber-cement backer board complying with ISO 8336, Category A, is a suitable *backing* for decoration with tile, natural stone, or dimensioned stone *veneer* on exterior walls.

2104.5 Fiber-cement backer board and underlayment construction. Fiber-cement backer board and underlayment complying with Section 2103.15.1, 2103.15.2, or 2103.15.3, shall be installed in accordance with approved manufacturer's instructions.

Add new standard to Chapter 35 as follows:

ISO

ISO 8336 Fibre-cement flat sheets -- Product Specification and Test Methods

Reason: Fiber-cement backer board and underlayment products are cement-based masonry-type products currently recognized for use through ICC-ES evaluation reports (see attached ESR-1381[reference Sections 2, 3 and 4.3], ESR-2280[reference Sections 2, 3 and 4], and ESR-2292[reference Sections 2, 3 and 4.2]). The inclusion in this Code Section confirms their currently recognized use as a base for tile setting materials also included in Chapter 21 of the Code. Fiber-cement backer board and underlayment products are masonry-type products currently recognized for use through ICC-ES evaluation reports (see attached ESR-1381[reference Sections 2.0, 4.3], ESR-2280[reference Section 4.2], and ESR-2292[reference Section 4.2]). The new reference here provides construction guidance. "See the ICC-ES website (http://www.icc-es.org/) to gain access to the referenced ESR reports. "

Cost Impact: The code change proposal will not increase the cost of construction because the proposed addition of fiber-cement backer board or underlayment products only provides for the choice and use of a type of backer board or underlayment product currently recognized through evaluation reports for use in accordance with the Code.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S221-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2103 (NEW)-S-MULDER.doc

S222–12

202, 2102.1, 2103.1, 2103.2, 2103.3, 2103.4, 2103.5, 2103.6, 2103.7, 2103.8, 2103.9, 2103.12, 2103.13, 2103.14

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards, (jthompson@nema.org), Phil Samblanet, Masonry Alliance for Codes and Standards, representing The Masonry Society (psamblanet@masonrysociety.org)

Delete without substitution:

SECTION 202
DEFINITIONS

~~**THIN-BED MORTAR.** *Mortar* for use in construction of AAC unit masonry with *joints* 0.06 inch (1.5 mm) or less.~~

Revise as follows:

2102.1 General. For the purposes of this chapter and as used elsewhere in this code, the following terms are defined in Chapter 2:

~~**THIN-BED MORTAR.**~~

2103.1 Masonry units. Concrete masonry units, clay or shale masonry units, stone masonry units, glass unit masonry, and AAC masonry units shall comply with Article 2.3 of TMS 602/ACI 530.1/ASCE 6. Architectural cast stone shall conform to ASTM C1364.

~~**2103.1 Concrete masonry units.** Concrete masonry units shall conform to the following standards: ASTM C 55 for concrete brick; ASTM C 73 for calcium silicate face brick; ASTM C 90 for load-bearing concrete masonry units or ASTM C 744 for prefaced concrete and calcium silicate masonry units.~~

~~**2103.2 Clay or shale masonry units.** Clay or shale masonry units shall conform to the following standards: ASTM C 34 for structural clay *load-bearing wall* tile; ASTM C 56 for structural clay nonload-bearing wall tile; ASTM C 62 for building brick (solid masonry units made from clay or shale); ASTM C 1088 for solid units of thin veneer brick; ASTM C 126 for ceramic-glazed structural clay facing tile, facing brick and solid masonry units; ASTM C 212 for structural clay facing tile; ASTM C 216 for facing brick (solid masonry units made from clay or shale); ASTM C 652 for hollow brick (hollow masonry units made from clay or shale) or ASTM C 1405 for glazed brick (single-fired solid brick units).~~

> **Exception:** Structural clay tile for nonstructural use in fireproofing of structural members and in wall furring shall not be required to meet the compressive strength specifications. The fire-resistance rating shall be determined in accordance with ASTM E 119 or UL 263 and shall comply with the requirements of Table 602.

~~**2103.3 AAC masonry.** AAC masonry units shall conform to ASTM C 1386 for the strength class specified.~~

~~**2103.4 Stone masonry units.** Stone masonry units shall conform to the following standards: ASTM C 503 for marble building stone (exterior); ASTM C 568 for limestone building stone; ASTM C 615 for granite building stone; ASTM C 616 for sandstone building stone; or ASTM C 629 for slate building stone.~~

~~**2103.5 Architectural cast stone.** Architectural cast stone shall conform to ASTM C 1364.~~

~~**2103.6 Ceramic tile.** Ceramic tile shall be as defined in, and shall conform to the requirements of, ANSI A137.1.~~

~~**2103.7 Glass unit masonry.** Hollow glass units shall be partially evacuated and have a minimum average glass face thickness of 3/16 inch (4.8 mm). Solid glass-block units shall be provided when required. The surfaces of units intended to be in contact with mortar shall be treated with a polyvinyl butyral coating or latex-based paint. Reclaimed units shall not be used.~~

~~**2103.8**~~ **2103.1.1 Second-hand units.** Second-hand masonry units shall not be reused unless they conform to the requirements of new units. The units shall be of whole, sound materials and free from cracks and other defects that will interfere with proper laying or use. Old mortar shall be cleaned from the unit before reuse.

~~**2103.9 Mortar.** Mortar for use in masonry construction shall conform to ASTM C 270 and Articles 2.1 and 2.6 A of TMS 602/ACI 530.1/ASCE 6, except for mortars listed in Sections 2103.10, 2103.11 and 2103.12. Type S or N mortar conforming to ASTM C 270 shall be used for glass unit masonry.~~

2103.2 Mortar. Mortar for masonry construction shall comply with Section 2103.2.1, 2103.2.2, or 2103.2.3.

2103.2.1 Masonry mortar. Mortar for use in masonry construction shall conform to Articles 2.1 and 2.6 A of TMS 602/ACI 530.1/ASCE 6.

~~**2103.10**~~ **2103.2.2 Surface-bonding mortar.** Surface-bonding mortar shall comply with ASTM C 887. Surface bonding of concrete masonry units shall comply with ASTM C 946.

~~**2103.11**~~ **2103.2.3 Mortars for ceramic wall and floor tile.** Portland cement mortars for installing ceramic wall and floor tile shall comply with ANSI A108.1A and ANSI A108.1B and be of the compositions indicated in Table 2103.11.

~~**2103.12 Mortar for AAC masonry.** Thin-bed mortar for AAC masonry shall comply with Article 2.1 C.1 of TMS 602/ ACI 530.1/ASCE 6. Mortar used for the leveling courses of AAC masonry shall comply with Article 2.1 C.2 of TMS 602/ ACI 530.1/ASCE 6.~~

~~**2103.13**~~ **2103.3 Grout.** Grout shall comply with Article 2.2 of TMS 602/ACI 530.1/ASCE 6.

~~**2103.14**~~ **2103.4 Metal reinforcement and accessories.** Metal reinforcement and accessories shall conform to Article 2.4 of TMS 602/ACI 530.1/ASCE 6. Where unidentified reinforcement is *approved* for use, not less than three tension and three bending tests shall be made on representative specimens of the reinforcement from each shipment and grade of reinforcing steel proposed for use in the work.

Reason: The modifications proposed here simply consolidate the material requirements of Section 2103 by referencing the appropriate articles in TMS 602 instead of transcribing these provisions into the IBC. No substantive change is intended or implied. Some provisions are maintained in Section 2103 as they are not addressed by TMS 602. These include: architectural cast stone meeting ASTM C1364, compressive strength exemptions for structural clay tile used as fireproofing, second-hand units, surface-bonding mortar, mortars for tile, and testing of unidentified reinforcement and accessories.

Cost Impact: The code change proposal will not increase the cost of construction.

S222-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2103-S-SAMBLANET-THOMPSON.doc

S223–12
2103.1, Chapter 35 (NEW)

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@nema.org)

Revise as follows:

2103.1 Concrete masonry units. Concrete masonry units shall conform to the following standards: ASTM C 55 for concrete brick; ASTM C 73 for calcium silicate face brick; ASTM C 90 for load-bearing concrete masonry units or ASTM C 744 for prefaced concrete and calcium silicate masonry units or ASTM C1634 for concrete facing brick.

Add new standard to Chapter 35 as follows:

ASTM

C1634-11, Specification for Concrete Facing Brick

Reason: The change proposed to introduce a reference to ASTM C1634 that addresses the minimum requirements for concrete facing brick. Concrete facing brick manufactured to comply with ASTM C1634 are similar in nature to concrete brick manufactured to comply with ASTM C55, with a few notable exceptions as explained in a non-mandatory note contained in ASTM C1634:

NOTE 1—Specification C55 addresses concrete building brick used in non-facing, utilitarian applications (previously referred to in earlier editions of Specification C55 as Grade S—for general use where moderate strength and resistance to frost action and moisture penetration are required). This specification differs from Specification C55 in that it includes expanded consideration for properties of concrete brick used in facing applications and other exposures (previously referred to in earlier editions of Specification C55 as Grade N—for use as architectural veneer and facing units in exterior walls and for use where high strength and resistance to moisture penetration and severe frost action are desired).

Due to the intended applications of C1634 unit, the physical requirements contained in ASTM C1634 are more stringent relative to those of ASTM C55. For example, the average compressive strength of ASTM C55 brick is 2,500 psi; whereas ASTM C1634 required a minimum compressive strength of 3,500 psi. Similarly the maximum absorption requirements of ASTM C1634 are less than the corresponding requirements of ASTM C55.

Historically, the physical requirements for ‘utility brick’ and ‘facing brick’ were covered together within ASTM C55 (as Grade S and Grade N brick, respectively); albeit with unique requirements for each. This often resulted in confusion in the field when a specification simply cited “ASTM C55”, as it was not clear if Grade S or Grade N brick were intended. As a result, the minimum physical requirements for ‘utility brick’ and ‘facing brick’ were separated into their own unique standards.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S223-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2103.1-S-THOMPSON.doc

S224–12
2103.15 (NEW), Chapter 35 (NEW)

Proponent: James K. Hicks, P.E., CeraTech, Inc., representing self (jim.hicks@ceratechinc.com)

Add new text as follows:

2103.15 Rapid Hardening Cement. Rapid hardening hydraulic cement shall conform to ASTM C1600,

Add new standard to Chapter 35 as follows:

ASTM

C1600-11 Standard Specification for Rapid Hardening Hydraulic Cement

Reason: For those instances wherein rapid hardening is desired, cements conforming to ASTM C 1600 Standard Specification for Rapid hardening Hydraulic Cements are useable. ASTM C 1600 can be one of four cement types, General Rapid Hardening (GRH), Moderate Rapid Hardening (MRH), Very Rapid Hardening (VRH) and Ultra Rapid Hardening (URH).

C 1600 is a Specification giving numerous performance requirements. Primary characteristics (with inherent increased design flexibility) are:

•Can produce rapid-hardening concrete, precast concrete, block, mortar and grout.
•Depending on the type cement used and the specific mixture, cements meeting ASTM C 1600 can provide normal, medium or fast time to service (1.5 to 48 h)
•ASTM C 1600 has rigid durability requirements.

ASTM C 1600 cements are used in products such as:

• Materials for Concrete Repairs
•High Strength Grouts
•Precast
•Paving
•Some Cements - Mass Concrete
•Some Cements – Heat Resistant
•Some Cements – Chemical Resistant

In addition to following pertinent ACI and ASTM requirements, users of C 1600 cements must heed manufacturers instructions for use. Specific durability aspects of any given mortar or concrete should be evaluated by the appropriate test method(s).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S224-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2103.15 (NEW)-S-HICKS.doc

S225–12
2104.1, 2104.1.1, 2104.1.2, 3104.1.3, 2104.1.4, 2104.1.5, 2104.1.6, 2104.2, 2104.2.1, 2104.3, 2104.4

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@nema.org), Phil Samblanet, The Masonry Society, representing The Masonry Society (psamblanet@masonrysociety.org)

Revise as follows:

2104.1 Masonry construction. Masonry construction shall comply with the requirements of Sections ~~2104.1.1 through 2104.4~~ 2104.1.1, 2104.1.2 and with TMS 602/ACI 530.1/ASCE 6.

~~**2104.1.1 Tolerances.** Masonry, except masonry veneer, shall be constructed within the tolerances specified in TMS 602/ACI 530.1/ASCE 6.~~

~~**2104.1.2 Placing mortar and units.** Placement of mortar, grout, and clay, concrete, glass, and AAC masonry units shall comply with TMS 602/ACI 530.1/ASCE 6.~~

~~**2104.1.3 Installation of wall ties.** Wall ties shall be installed in accordance with TMS 602/ACI 530.1/ASCE 6.~~

~~**2104.1.4 Chases and recesses.** Chases and recesses shall be constructed as masonry units are laid. Masonry directly above chases or recesses wider than 12 inches (305 mm) shall be supported on lintels.~~

~~**2104.1.5 Lintels.** The design for lintels shall be in accordance with the masonry design provisions of either Section 2107 or 2108.~~

~~**2104.1.6**~~ **2104.1.1 Support on wood.** Masonry shall not be supported on wood girders or other forms of wood construction except as permitted in Section 2304.12.

~~**2104.2 Corbeled masonry.** Corbeled masonry shall comply with the requirements of Section 1.12 of TMS 402/ACI 530/ ASCE 5.~~

~~**2104.2.1**~~ **2104.1.2 Molded cornices.** Unless structural support and anchorage are provided to resist the overturning moment, the center of gravity of projecting masonry or molded cornices shall lie within the middle one-third of the supporting wall. Terra cotta and metal cornices shall be provided with a structural frame of *approved* noncombustible material anchored in an *approved* manner.

~~**2104.3 Cold weather construction.** The cold weather construction provisions of TMS 602/ACI 530.1/ASCE 6, Article 1.8 C, shall be implemented when the ambient temperature falls below 40°F (4°C).~~

~~**2104.4 Hot weather construction.** The hot weather construction provisions of TMS 602/ACI 530.1/ASCE 6, Article 1.8 D, shall be implemented when the ambient air temperature exceeds 100°F (37.8°C), or 90°F (32.2°C) with a wind velocity greater than 8 mph (12.9 km/hr).~~

Reason: The modifications proposed here simply consolidate the masonry construction requirements of Section 2104 by referencing the requirements of TMS 602 instead of transcribing these provisions into the IBC. No substantive change is intended or implied. Some provisions are maintained in Section 2104 as they are not addressed by TMS 602. These include: support of masonry on wood construction and support/anchorage of molded cornices and terra cotta.

Cost Impact: The code change proposal will not increase the cost of construction.

S225-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2104-S-SAMBLANET-THOMPSON.doc

S226–12
202, 2102.1, 2105.1 thru 2105.3.3

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org), Phil Samblanet, The Masonry Society, representing The Masonry Society (psamblanet@masonrysociety.org)

Delete without substitution:

SECTION 202
DEFINITIONS

~~**COMPRESSIVE STRENGTH OF MASONRY.** Maximum compressive force resisted per unit of net cross-sectional *area* of *masonry*, determined by the testing of masonry *prisms*.~~

~~**PRISM.** An assemblage of *masonry units* and *mortar* with or without grout used as a test specimen for determining properties of the *masonry*.~~

Revise as follows:

2102.1 General. For the purposes of this chapter and as used elsewhere in this code, the following terms are defined in Chapter 2:

~~**COMPRESSIVE STRENGTH OF MASONRY.**~~

~~**PRISM**~~

~~**SECTION 2105**~~
~~**QUALITY ASSURANCE**~~

~~**2105.1 General.**~~

~~**2105.2 Acceptance relative to strength requirements.**~~

~~**2105.2.1 Compliance with *f ′m* and *f ′AAC*.**~~

~~**2105.2.2 Determination of compressive strength.**~~

~~**2105.2.2.1 Unit strength method.**~~

~~**2105.2.2.1.1 Clay masonry.**~~

~~**TABLE 2105.2.2.1.1**~~
~~**COMPRESSIVE STRENGTH OF CLAY MASONRY**~~

~~**2105.2.2.1.2 Concrete masonry.**~~

~~**TABLE 2105.2.2.1.2**~~
~~**COMPRESSIVE STRENGTH OF CONCRETE MASONRY**~~

~~**2105.2.2.1.3 AAC masonry.**~~

~~**2105.2.2.2 Prism test method.**~~

~~**2105.2.2.2.1 General.**~~

~~**2105.2.2.2.2 Number of prisms per test.**~~

~~**2105.3 Testing prisms from constructed masonry.**~~

~~**2105.3.1 Prism sampling and removal.**~~

~~**2105.3.2 Compressive strength calculations.**~~

~~**2105.3.3 Compliance.**~~

SECTION 2105
QUALITY ASSURANCE

2105.1 General. A quality assurance program shall be used to ensure that the constructed masonry is in compliance with the *construction documents*.

The quality assurance program shall comply with the inspection and testing requirements of Chapter 17 and TMS 602/ACI 530.1/ASCE 6.

Reason: The modifications proposed here simply consolidate the masonry quality assurance requirements of Section 2105 by referencing the requirements of TMS 602 instead of transcribing these provisions into the IBC. No substantive change is intended or implied. The provisions of Section 2105 are virtually identical to the corresponding requirements in TMS 602.

Cost Impact: The code change proposal will not increase the cost of construction.

S226-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2105 (NEW)-S-SAMBLANET.doc

S227–12
2107.1, 2107.2, 2107.2.1, 2107.3, 2107.4, 2108.1, 2108.2, 2108.3

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Code and Standards (Thompson@nema.org)

Revise as follows:

2107.1 General. The design of masonry structures using *allowable stress design* shall comply with Section 2106 and the requirements of Chapters 1 and 2 of TMS 402/ACI 530/ ASCE 5 except as modified by Sections 2107.2 ~~through 2107.4~~ and 2107.3.

~~**2107.2 TMS 402/ACI 530/ASCE 5, Section 2.1.7.7.1.1, lap splices.** In lieu of Section 2.1.7.7.1.1, it shall be permitted to design lap splices in accordance with Section 2107.2.1.~~

~~**2107.2.1 Lap splices.** The minimum length of lap splices for reinforcing bars in tension or compression, l_d, shall be~~

~~$l_d = 0.002db\ f_s$ **(Equation 21-1)**~~

~~For SI: $l_d = 0.29db\ f_s$~~

~~but not less than 12 inches (305 mm). In no case shall the length of the lapped splice be less than 40 bar diameters.~~

~~where:~~

~~d_b = Diameter of reinforcement, inches (mm).~~
~~f_s = Computed stress in reinforcement due to design loads, psi (MPa).~~

~~In regions of moment where the design tensile stresses in the reinforcement are greater than 80 percent of the allowable steel tension stress, F_s, the lap length of splices shall be increased not less than 50 percent of the minimum required length. Other equivalent means of stress transfer to accomplish the same 50 percent increase shall be permitted. Where epoxy coated bars are used, lap length shall be increased by 50 percent.~~

~~2107.3~~ 2107.2 TMS 402/ACI 530/ASCE 5, Section 2.1.7.1, splices of reinforcement. Modify Section 2.1.8.7 as follows:

> 2.1.7.1 Splices of reinforcement. Lap splices, welded splices or mechanical splices are permitted in accordance with the provisions of this section. All welding shall conform to AWS D1.4. Welded splices shall be of ASTM A 706 steel reinforcement. Reinforcement larger than No. 9 (M #29) shall be spliced using mechanical connections in accordance with Section 2.1.7.7.3.

~~2107.4~~ 2107.3 TMS 402/ACI 530/ASCE 5, Section 2.3.6, maximum bar size. Add the following to Chapter 2:

> 2.3.7 Maximum bar size. The bar diameter shall not exceed one-eighth of the nominal wall thickness and shall not exceed one-quarter of the least dimension of the cell, course or collar joint in which it is placed.

2108.1 General. The design of masonry structures using strength design shall comply with Section 2106 and the requirements of Chapters 1 and 3 of TMS 402/ACI 530/ ASCE 5, except as modified by Section 2108.2 ~~through 2108.3~~.

Exception: AAC masonry shall comply with the requirements of Chapters 1 and 8 of TMS 402/ACI 530/ASCE 5.

~~**2108.2 TMS 402/ACI 530/ASCE 5, Section 3.3.3.3 development.** Modify the second paragraph of Section 3.3.3.3 as follows:~~

~~The required development length of reinforcement shall be determined by Equation (3-16), but shall not be less than 12 inches (305 mm) and need not be greater than 72~~ ~~d_b.~~

~~**2108.3**~~ **2108.2** **TMS 402/ACI 530/ASCE 5, Section 3.3.3.4, splices.** Modify items (c) and (d) of Section 3.3.3.4 as follows:

3.3.3.4 (c). A welded splice shall have the bars butted and welded to develop at least 125 percent of the yield strength, f_y, of the bar in tension or compression, as required. Welded splices shall be of ASTM A 706 steel reinforcement. Welded splices shall not be permitted in plastic hinge zones of intermediate or special reinforced walls or special moment frames of masonry.

3.3.3.4 (d). Mechanical splices shall be classified as Type 1 or 2 according to Section 21.2.6.1 of ACI 318. Type 1 mechanical splices shall not be used within a plastic hinge zone or within a beam-column joint of intermediate or special reinforced masonry shear walls or special moment frames. Type 2 mechanical splices are permitted in any location within a member.

Reason: Several cycles back the allowable stress and strength design lap splicing requirements for masonry construction were modified as research in this area was still underway. The modifications introduced into the IBC were a stop-gap measure of implementing lap splice detailing requirements based upon similar provisions from the UBC (for ASD) or an upper lap length cap (for SD) while this research was being completed. The research is now complete and the results are reflected in the latest edition of the TMS 402 standard; and as such the lap splicing modifications in Chapter 21 are proposed to be deleted.

Early in the research investigation, concern was expressed that lap splice lengths would become unfeasibly long for certain combinations of bar size, clearance, or cover distances in order to maintain the ductility inherently assumed or explicitly required by contemporary seismic design models and loading requirements as summarized in the following research investigation: http://www.ncma.org/resources/design/Research%20Reports/MR12.pdf

As this research concludes, some reinforcement detailing alternatives (such as a very large diameter reinforcing bar located with minimal masonry cover distance) do not provide targeted strength or ductility with lap splices unless the lap length is exceptionally long or reinforcement is placed transverse to the lap-spliced reinforcement (such as reinforcement in bond beams) as highlighted in the following report: http://www.ncma.org/resources/design/Research%20Reports/MR33.pdf. The IBC lap splice modifications proposed for deletion are based on an upper limit bond strength between reinforcement and grout (in the case of ASD) and an arbitrary cap (in the case of SD) that may not capture all possible failure modes, and therefore may not provide the same level of performance as the lap splice detailing requirements in the TMS 402 reference standard.

Cost Impact: The code change proposal will not increase the cost of construction.

S227-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2107-S-THOMPSON.doc

S228–12
2108.3

Proponent: Charles S. Bajnai, Chesterfield County, VA, representing ICC Building Code Action Committee

Revise as follows:

2108.3 TMS 402/ACI 530/ASCE 5, Section 3.3.3.4, splices. Modify items (c) and (d) of Section 3.3.3.4 as follows:

> 3.3.3.4 (c). A welded splice shall have the bars butted and welded to develop at least 125 percent of the yield strength, f_y, of the bar in tension or compression, as required. Welded splices shall be of ASTM A 706 steel reinforcement. Welded splices shall not be permitted in plastic hinge zones of intermediate or special reinforced walls ~~or special moment frames of masonry~~.
>
> 3.3.3.4 (d). Mechanical splices shall be classified as Type 1 or 2 according to Section 21.2.6.1 of ACI 318. Type 1 mechanical splices shall not be used within a plastic hinge zone or within a beam-column joint of intermediate or special reinforced masonry shear walls ~~or special moment frames~~. Type 2 mechanical splices are permitted in any location within a member.

Reason: The International Code Council's Building Code Action Committee was asked to look at addressing the "special moment frames" reference in the code. This term actually refers to masonry wall frames [a.k.a. special moment frames] which were located in Section 2108.9.6 of the 2000 IBC. The requirements for masonry wall frames were removed from the IBC by code change S145-02 which, along with S122-02, substituted a reference to the strength requirements of the 2002 MSJC for the masonry strength design provisions of the IBC. No other current code or standard contains requirements for masonry wall frames so the reference serves no purpose. The committee also conferred with the Masonry Society and it was affirmed that the deletion of this term is appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

S228-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2108.3-S-BAJNAI-BCAC.doc

S229–12
2111.1, 2111.3, 2111.4, 2113.1, 2113.3, 2113.4

Proponent: Charles S. Bajnai, Chesterfield County, VA, representing ICC Building Code Action Committee (bajnaic@chesterfield.gov)

Revise as follows:

SECTION 2111
MASONRY FIREPLACES

~~**2111.1 Definition.** A masonry fireplace is a fireplace constructed of concrete or masonry. Masonry fireplaces shall be constructed in accordance with this section.~~

2111.1 General. The construction of masonry fireplaces consisting of concrete or masonry shall be in accordance with this section.

~~**2111.3 Seismic reinforcing.** In structures assigned to Seismic Design Category A or B, reinforcement and seismic anchorage are not required. Masonry or concrete fireplaces shall be constructed, anchored, supported and reinforced as required in this chapter. In structures assigned to *Seismic Design Category* C or D, masonry and concrete fireplaces shall be reinforced and anchored as detailed in Sections 2111.3.1, 2111.3.2, 2111.4 and 2111.4.1 for chimneys serving fireplaces. In structures assigned to *Seismic Design Category* E or F, masonry and concrete chimneys shall be reinforced in accordance with the requirements of Sections 2101 through 2108.~~

2111.3 Seismic reinforcing. In structures assigned to *Seismic Design Category* A or B, seismic reinforcement is not required. In structures assigned to *Seismic Design Category* C or D, masonry fireplaces shall be reinforced and anchored as detailed in Sections 2111.3.1, 2111.3.2 and 2111.4. In structures assigned to *Seismic Design Category* E or F, masonry fireplaces shall be reinforced in accordance with the requirements of Sections 2101 through 2108.

~~**2111.4 Seismic anchorage.** Masonry and concrete chimneys in structures assigned to *Seismic Design Category* C or D shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the *exterior walls*. Anchorage shall conform to the following requirements.~~

2111.4 Seismic anchorage.. Masonry fireplaces and foundations shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade with two 3/16-inch by 1-inch (4.8 mm by 25 mm) straps embedded a minimum of 12 inches (305 mm) into the chimney. Straps shall be hooked around the outer bars and extend 6 inches (152 mm) beyond the bend. Each strap shall be fastened to a minimum of four floor joists with two 1/2-inch (12.7 mm) bolts.

Exception: Seismic anchorage is not required for the following;

1. In structures assigned to *Seismic Design Category* A or B.
2. Where the masonry fireplace is constructed completely within the *exterior walls*.

~~**2111.4.1 Anchorage.** Two 3/16-inch by 1-inch (4.8 mm by 25.4 mm) straps shall be embedded a minimum of 12 inches (305 mm) into the chimney. Straps shall be hooked around the outer bars and extend 6 inches (152 mm) beyond the bend. Each strap shall be fastened to a minimum of four floor joists with two 1/2-inch (12.7 mm) bolts.~~

~~**2113.1 Definition.** A masonry chimney is a chimney constructed of solid masonry units, hollow masonry units grouted solid, stone or concrete, hereinafter referred to as “masonry.” Masonry chimneys shall be constructed, anchored, supported and reinforced as required in this chapter.~~

2113.1 General. The construction of masonry chimneys consisting of solid masonry units, hollow masonry units grouted solid, stone or concrete shall be in accordance with this section.

~~**2113.3 Seismic reinforcing.** Masonry or concrete chimneys shall be constructed, anchored, supported and reinforced as required in this chapter. In structures assigned to *Seismic Design Category* C or D, masonry and concrete chimneys shall be reinforced and anchored as detailed in Sections 2113.3.1, 2113.3.2 and 2113.4. In structures assigned to *Seismic Design Category* A or B, reinforcement and Seismic anchorage is not required. In structures assigned to *Seismic Design Category* E or F, masonry and concrete chimneys shall be reinforced in accordance with the requirements of Sections 2101 through 2108.~~

2113.3 Seismic reinforcing. In structures assigned to *Seismic Design Category* A or B, seismic reinforcement is not required. In structures assigned to *Seismic Design Category* C or D, masonry chimneys shall be reinforced and anchored as detailed in Sections 2113.3.1, 2113.3.2 and 2113.4. In structures assigned to *Seismic Design Category* E or F, masonry chimneys shall be reinforced in accordance with the requirements of Sections 2101 through 2108 and anchored as detailed in Section 2113.4.

~~**2113.4 Seismic anchorage.** Masonry and concrete chimneys and foundations in structures assigned to *Seismic Design Category* C or D shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the *exterior walls*. Anchorage shall conform to the following requirements.~~

2113.4 Seismic anchorage.. Masonry chimneys and foundations shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade with two 3/16-inch by 1-inch (4.8 mm by 25 mm) straps embedded a minimum of 12 inches (305 mm) into the chimney. Straps shall be hooked around the outer bars and extend 6 inches (152 mm) beyond the bend. Each strap shall be fastened to a minimum of four floor joists with two 1/2-inch (12.7 mm) bolts.

Exception: Seismic anchorage is not required for the following;

1. In structures assigned to *Seismic Design Category* A or B.
2. Where the masonry fireplace is constructed completely within the *exterior walls*.

~~**2113.4.1 Anchorage.** Two 3/16-inch by 1-inch (4.8 mm by 25 mm) straps shall be embedded a minimum of 12 inches (305 mm) into the chimney. Straps shall be hooked around the outer bars and extend 6 inches (152 mm) beyond the bend. Each strap shall be fastened to a minimum of four floor joists with two 1/2-inch (12.7 mm) bolts.~~

Reason: The ICC Building Code Action Committee was asked to look at several concerns with sections 2111 and 2113.

First, it was suggested that a definition for masonry fireplaces and chimneys be added to section 202 instead of the current code language that provides a definition of masonry fireplaces and masonry chimneys within the text of the code, Sections 2111.1 and 2113.1 respectively. However, the was the opinion of the committee that definitions are not necessary for this section. The word “Definitions” is proposed to be removed from the titles of Section 2111.1 and Section 2113.1 as shown and the language was modified from the current “defining” language to be “directive” language. No technical changes were made.

Secondly, there have been errors in the code masonry fireplaces and masonry chimneys were split into two separate sections (S261-99). Sections 2111.3 and 2111.4 refer to seismic reinforcement and anchorage for **fireplaces** while 2113.3 and 2113.4 refer to the seismic reinforcement and anchorage requirements for **chimneys**.

In section 2111.3 it states that “In structures assigned to Seismic Design Category C or D, masonry and concrete **fireplaces** shall be reinforced and anchored…..” Then the following sentence says, “In structures assigned to Seismic Design Category E or F, masonry and concrete **chimneys** shall be reinforced in accordance with….”. Section 2111 is describing **fireplaces** while 2113 describes **chimneys.** So, the reference to “chimneys” should be to “fireplaces”. In addition to the wrong word being used, as written, it implies that fireplaces in SDC C and D are required to be “anchored” while (by omission due to the wrong word) they are not required to be “anchored” in SDC E and F.

In this proposal, sections 2111.3 and 2113.3 have been re-written to address those items as well as to re-organize them to be more clear. In addition, the “Seismic anchorage” and “Anchorage” sections 2111.4/2111.4.1 and 2113.4/2113.4.1, respectively, have been combined for clarity and to remove unnecessary language.

No technical changes have been made and no additional requirements have been added to either section.

Cost Impact: The code change proposal will not increase the cost of construction.

S229-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2111.1-S-BAJNAI-BCAC.doc

S230–12
2111.1

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards and Clay Flue Lining Institute (buckley@rumford.com)

Revise as follows:

2111.1 Definition. A masonry fireplace is a fireplace constructed of ~~concrete or masonry~~ solid masonry units, hollow masonry units grouted solid, stone or concrete, hereinafter referred to as "masonry". Masonry fireplaces shall be constructed in accordance with this section.

Reason: To match the language in Section 2113.1 and in the IRC

Cost Impact: The code change proposal will not increase the cost of construction.

S230-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2111.1-S-BUCKLEY.doc

S231–12
2111.2, 2111.3, 2111.4, 2111.12, 2113.3, 2113.3.1, 2113.3.2

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards and Clay Flue Lining Institute (buckley@rumford.com)

Revise as follows:

2111.2 Footings and foundations. Footings for masonry fireplaces ~~and their chimneys~~ shall be constructed of concrete or solid masonry at least 12 inches (305 mm) thick and shall extend at least 6 inches (153 mm) beyond the face of the fireplace or foundation wall on all sides. Footings shall be founded on natural undisturbed earth or engineered fill below frost depth. In areas not subjected to freezing, footings shall be at least 12 inches (305 mm) below finished grade.

2111.3 Seismic ~~reinforcing~~ reinforcement. In structures assigned to Seismic Design Category A or B, reinforcement and seismic anchorage are not required. Masonry or concrete fireplaces shall be constructed, anchored, supported and reinforced as required in this chapter. In structures assigned to *Seismic Design Category* C or D, masonry and concrete fireplaces shall be reinforced and anchored as detailed in Sections 2111.3.1, 2111.3.2, 2111.4 and 2111.4.1 for chimneys serving fireplaces. In structures assigned to *Seismic Design Category* E or F, masonry and concrete ~~chimneys~~ fireplaces shall be reinforced in accordance with the requirements of Sections 2101 through 2108.

2111.4 Seismic anchorage. Masonry and concrete ~~chimneys~~ fireplaces in structures assigned to *Seismic Design Category* C or D shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the *exterior walls*. Anchorage shall conform to the following requirements.

2111.12 Fireplace fireblocking. All spaces between fireplaces and floors and ceilings through which fireplaces pass shall be fireblocked with noncombustible material securely fastened in place. The fireblocking of spaces between wood joists, beams or headers shall be to a depth of 1 inch (25 mm) and shall only be placed on strips of metal or metal lath laid across the spaces between combustible material and the ~~chimney~~ fireplaces.

2113.3 Seismic ~~reinforcing~~ reinforcement. Masonry or concrete chimneys shall be constructed, anchored, supported and reinforced as required in this chapter. In structures assigned to *Seismic Design Category* C or D, masonry and concrete chimneys shall be reinforced and anchored as detailed in Sections 2113.3.1, 2113.3.2 and 2113.4. In structures assigned to *Seismic Design Category* A or B, reinforcement and seismic anchorage is not required. In structures assigned to *Seismic Design Category* E or F, masonry and concrete chimneys shall be reinforced in accordance with the requirements of Sections 2101 through 2108.

2113.3.1 Vertical ~~reinforcing~~ reinforcement. For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars anchored in the foundation shall be placed in the concrete between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section 2103.12. Grout shall be prevented from bonding with the flue liner so that the flue liner is free to move with thermal expansion. For chimneys greater than 40 inches (1016 mm) wide, two additional No. 4 vertical bars shall be provided for each additional 40 inches (1016 mm) in width or fraction thereof.

2113.3.2 Horizontal ~~reinforcing~~ reinforcement. Vertical reinforcement shall be placed enclosed within 1/4-inch (6.4 mm) ties, or other reinforcing of equivalent net cross-sectional area, spaced not to exceed 18 inches (457 mm) o.c. in concrete, or placed in the bed joints of unit masonry, at a minimum of every 18 inches (457 mm) of vertical height. Two such ties shall be provided at each bend in the vertical bars.

Reason: More clear, better English.

Cost Impact: The code change proposal will not increase the cost of construction.

S231-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2111.2-S-BUCKLEY.doc

S232–12
2111.11

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards and Clay Flue Lining Institute (buckley@rumford.com)

Revise as follows:

2111.11 Fireplace clearance. Any portion of a masonry fireplace located in the interior of a building or within the *exterior wall* of a building shall have a clearance to combustibles of not less than 2 inches (51 mm) from the front faces and sides of masonry fireplaces and not less than 4 inches (102 mm) from the back faces of masonry fireplaces. The airspace shall not be filled, except <u>with noncombustible insulation or</u> to provide fireblocking in accordance with Section 2111.12.

Exceptions:

1. Masonry fireplaces *listed* and labeled for use in contact with combustibles in accordance with UL 127 and installed in accordance with the manufacturer's installation instructions are permitted to have combustible material in contact with their exterior surfaces.
2. When masonry fireplaces are constructed as part of masonry or concrete walls, combustible materials shall not be in contact with the masonry or concrete walls less than 12 inches (306 mm) from the inside surface of the nearest firebox lining.
3. Exposed combustible *trim* and the edges of sheathing materials, such as wood siding, flooring and drywall, are permitted to abut the masonry fireplace sidewalls and hearth extension, in accordance with Figure 2111.11, provided such combustible *trim* or sheathing is a minimum of 12 inches (306 mm) from the inside surface of the nearest firebox lining.
4. Exposed combustible mantels or *trim* is permitted to be placed directly on the masonry fireplace front surrounding the fireplace opening, provided such combustible materials shall not be placed within 6 inches (153 mm) of a fireplace opening. Combustible material directly above and within 12 inches (305 mm) of the fireplace opening shall not project more than 1/8 inch (3.2 mm) for each 1-inch (25 mm) distance from such opening. Combustible materials located along the sides of the fireplace opening that project more than 11/2 inches (38 mm) from the face of the fireplace shall have an additional clearance equal to the projection.

Reason: To allow noncombustible insulation in clearance to combustible spaces. It clears up confusion with the reference to fireblocking (which can be noncombustible insulation) and is what builders do anyway.

Cost Impact: The code change proposal will not increase the cost of construction.

S232-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2111.11-S-BUCKLEY.doc

S233–12
2111.12

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards and Clay Flue Lining Institute (buckley@rumford.com)

Revise as follows:

2111.12 Fireplace fireblocking. All spaces between fireplaces and floors and ceilings through which fireplaces pass shall be fireblocked with noncombustible material securely fastened in place. The fireblocking of spaces between wood joists, beams or headers shall be ~~to a depth of 1 inch (25 mm) and shall only~~ self-supporting or be placed on strips of metal or metal lath laid across the spaces between combustible material and the ~~chimney~~ fireplace.

Reason: To make the language the same as in Section 2113.20. "Chimney" is replaced by "fireplace" as is appropriate in the fireplace section.

Cost Impact: The code change proposal will not increase the cost of construction.

S233-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2111.12-S-BUCKLEY.doc

S234–12
2112.2, 2112.5, Chapter 35 (NEW)

Proponent: Timothy N. Seaton, B.S.C.E, Empire Masonry Heaters LLC (tseaton@masonryheater.com)

Revise as follows:

2112.2 Installation. Masonry heaters shall be installed in accordance with this section and comply with one of the following:

1. Masonry heaters shall comply with the requirements of ASTM E 1602; or
2. Masonry heaters shall be *listed* and labeled in accordance with UL 1482 <u>or EN 15250</u> and installed in accordance with the manufacturer's installation instructions.

2112.5 Masonry heater clearance. Combustible materials shall not be placed within 36 inches (765 mm) of the outside surface of a masonry heater in accordance with NFPA 211, Section 8-7 (clearances for solid fuel-burning appliances), and the required space between the heater and combustible material shall be fully vented to permit the free flow of air around all heater surfaces.

Exceptions:

1. When the masonry heater wall thickness is at least 8 inches (203 mm) thick of solid masonry and the wall thickness of the heat exchange channels is at least 5 inches (127 mm) thick of solid masonry, combustible materials shall not be placed within 4 inches (102 mm) of the outside surface of a masonry heater. A clearance of at least 8 inches (203 mm) shall be provided between the gas-tight capping slab of the heater and a combustible ceiling.
2. Masonry heaters *listed* and labeled in accordance with UL 1482 <u>or EN 15250</u> and installed in accordance with the manufacturer's instructions.

Add new standard to Chapter 35 as follows:

<u>**EN**</u>

<u>EN 15250 - Slow heat release appliances fired by solid fuel – Requirements and test methods</u>

Reason: UL 1482, *Solid-Fuel Type Room Heaters*, was created to evaluate wood stoves and similar appliances. It does not address thermal mass storage devices of masonry construction such as masonry heaters and contains significant deficiencies in evaluating them. Specifically, UL 1482 stipulates fueling the appliance until temperature equilibrium is reached at which point the safety clearances are verified. This is not an appropriate end of test for masonry heaters and cannot in testing application actually be clearly reached. While UL 1482 may eventually be modified to specifically address masonry heaters, in 2007 the European standard EN 15250, *Slow heat release appliances fired by solid fuel. Requirements and test method,* was finalized specifically to address masonry heaters and similar devices and has since been adopted by 37 countries in Europe and elsewhere. Since Europe is the original source of virtually all masonry heater technology and since IBC already references European Union standards elsewhere, it is appropriate to reference this standard here. EN 15250 stipulates the same allowable temperature elevations of adjacent combustible materials as UL 1482 but uses an appropriate test fueling method.

Cost Impact: The code change proposal will not increase the cost of construction.

S234-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2112.2-S-SEATON.doc

S235–12
2112.5, Table 2112.1 (NEW), Chapter 35 (NEW)

Proponent: Timothy N. Seaton, B.S.C.E., Empire Masonry Heaters LLC

Revise as follows:

2112.5 Masonry heater clearance. Combustible materials shall not be placed within 36 inches (765 mm) of the outside surface of a masonry heater in accordance with NFPA 211, Section 8-7 (clearances for solid fuel-burning appliances), and the required space between the heater and combustible material shall be fully vented to permit the free flow of air around all heater surfaces.

Exceptions:

1. Where the masonry heater wall thickness is at least 8 inches (203 mm) thick of solid masonry and the wall thickness of the heat exchange channels is at least 5 inches (127 mm) thick of solid masonry, ~~combustible materials shall not be placed within 4 inches (102 mm) of the outside surface of a masonry heater. A clearance of at least 8 inches (203 mm) shall be provided between the gas-tight capping slab of the heater and a combustible ceiling.~~ or when the wall thicknesses are similarly 4 inches (102 mm) at the firebox and 2 ½ inches (64 mm) at the heat exchange channel but are lined with at least the inner 2 inches (51 mm) and 1 inch (25 mm) respectively of firebrick(ASTM C27 or ASTM C1261) or refractory equivalent, clearances shall be according to Table 2112.5
2. Where masonry heaters *listed* and labeled in accordance with UL 1482 and installed in accordance with the manufacturer's instructions clearances will be as listed.

TABLE 2112.5
MASONRY HEATER CLEARANCES TO COMBUSTIBLE MATERIALS

CONTROLLING STANDARD PROVISIONS	MINIMUM MASONRY HEATER WALL CONSTRUCTION THICKNESS		CLEARANCES FROM COMBUSTIBLE					
			WALLS				CEILINGS	
	Firebox	Channels	Unprotected	Non-combustible wall surface material[b]	Protective shield[c] (from shield)	Both surface[b] and shield[b] (from shield)	Unprotected	Protective shield[c] (from shield)
2112.5 ASTM E 1602 (with NFPA 211)			36" (914 mm)	As per NFPA 211 Section 12.6			As per NFPA 211 Section 12.6	
2112.5.1 ASTM E 1602 (with Exception 1)	8" (203 mm)	5" (127 mm)	4" (102 mm)				8" (203 mm)	
	4" (100 mm) [including 2" (50 mm) firebrick lining[a]]	2.5" (64 mm) [including 1" (25 mm) firebrick lining[a]}	10" (250 mm)	6" (150 mm)	5" (127 mm)	3" (75 mm)	10" (260 mm)	5" (127 mm)
2112.5.2 UL 1482/EN 15250 (with Exception 2)	As per manufacturer		As per listing				As per listing	

a. "Firebrick lining" is a lining constructed of firebrick conforming to ASTM C27 or C1261 or refactor equivalent.

b. "Non-combustible wall surface material" is a wall covering facing the masonry heater made from non-combustible material (Fire Class A) and having at least a 30 minute Fire Resistance Rating

c. "Protective shield" is a non-combustible protective shield placed between the masonry heater and the wall, which extends sideways beyond the heater, and is separated from the wall by at least 1.25 inches (30 mm) and from the floor and ceiling by at least 2 inches (50 mm). The clearance is measured from the shield.

Add new standard to Chapter 35 as follows:

EN

EN 15250-2007 Slow Heat Release Appliances Fired by Solid Fuel - Requirements and Test Methods

Reason: North American masonry heater technology is virtually all sourced in Europe where the devices have been built for centuries. In conformance with typical European standards, ASTM E1602, *Standard Guide for Construction of Solid Fuel Burning Masonry Heaters,* does not stipulate masonry heater wall thickness nor relate it to clearances to combustibles. In contrast to masonry fireplace construction and operation, masonry heater wall thickness does not necessarily relate to surface temperature but instead to the time it takes for the heat to begin radiating from the surface and to the total time radiation will occur. For this reason thicker wall construction may in fact be more dangerous with overfiring situations than thinner wall construction.

Until recent IBC and IRC code revisions, all minimum masonry heater clearances were 4" (102 mm) to surface wall or protective shield as per ASTM E1602. I can locate no documented examples of wall ignition from masonry heaters of any wall thickness at this clearance or under ASTM E1602 as the sole ruling clearance standard.

In the recent IBC/IRC code revisions "NFPA 211, Section 8-7 (clearances for solid fuel-burning appliances)" (*sic)* was made the ruling standard for masonry heater clearances instead of ASTM E1602 even though this former standard was created for wood stoves and similar appliances and had no real application to masonry heaters. This standard stipulates 36" clearance to combustible materials with possible reduction to 12" with approved reduction methods. These clearances may be realistic for metal stoves and similar appliances but are unnecessarily restrictive for masonry heaters which in contrast by definition cannot exceed 230º F (110º C) surface temperatures in normal operation (ASTM E1602 Section 3.2.14).

The recent IBC/IRC revisions created two exceptions to the NFPA 211 rule; 1) for lab tested and listed devices, and 2) for masonry heaters with thick firebox and heat channel walls which by European practice are only used for masonry heaters with large heat storage intended to be fired at very long intervals. This latter class of masonry heaters is built increasingly rarely in Europe as the energy codes were written and tightened there and lower output and more responsive masonry heating was required. The same change in code structure is occurring here in North America, and the 36" clearance stipulation for other than thick walled masonry heaters is making masonry heater construction in new projects and particularly in renovation projects unnecessarily complex and expensive. The typical masonry heater sold is custom in design and cannot support laboratory safety testing.

I am not proposing removing existing code clearance provisions though they have not been lab safety tested and verified (as the code provisions for masonry fireplaces have not). The existing safety tests, UL127 and UL1482 were created for manufactured metal appliances and limited in their application to masonry devices. Instead I am proposing IBC adopt building code provisions from Europe for masonry heater clearances where such clearances have been verified through decades and centuries of use. There is no overall European Union document for code built (as opposed to listed) masonry heater clearances. I am attaching the prevailing Austrian standard TRVB 105:1986, *Technical Regulations for Preventive Fire Protection: Fireplaces for Solid Fuels* as a more conservative European example. I propose these clearances, which are more restrictive than ASTM E1602, be adopted for masonry heaters not covered by the existing IBC language under an expanded Exception 1. Please note that in this Austrian standard "fireplaces" refers collectively to iron stoves, open fireplaces, and masonry heaters.

Note also that the ASTM C27 and C1261 firebrick citation is borrowed from existing IBC/IRC fireplace provisions. C1261 is no longer listed in the ASTM standards volume and may not have been renewed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S235-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2112.5 #1-S-SEATON.doc

S236–12
2112.5

Proponent: Timothy N. Seaton, B.S.C.E., Empire Masonry Heaters LLC (tseaton@masonryheater.com)

Revise as follows:

2112.5 Masonry heater clearance. Combustible materials shall not be placed within 36 inches (~~765~~ 914 mm) or the distance of the allowed reduction method ~~of~~ from the outside surface of a masonry heater in accordance with NFPA 211, Section ~~8-7 (clearances for solid fuel-burning appliances),~~ 12.6 Clearances from Solid Fuel-Burning Appliances, and the required space between the heater and combustible material shall be fully vented to permit the free flow of air around all heater surfaces.

Exceptions:

1. When the masonry heater wall thickness is at least 8 inches (203 mm) thick of solid masonry and the wall thickness of the heat exchange channels is at least 5 inches (127 mm) thick of solid masonry, combustible materials shall not be placed within 4 inches (102 mm) of the outside surface of a masonry heater. A clearance of at least 8 inches (203 mm) shall be provided between the gas-tight capping slab of the heater and a combustible ceiling.
2. Masonry heaters *listed* and labeled in accordance with UL 1482 and installed in accordance with the manufacturer's instructions.

Reason: 1) Metric conversion is incorrect; 2) NFPA 211 citation is incorrect; and 3) NFPA 211 Section 12.6 allows clearances under 36" with stipulated distance reduction strategies.

Cost Impact: The code change proposal will not increase the cost of construction.

S236-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2112.5 #2-S-SEATON.doc

S237–12
2113.19

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards and Clay Flue Lining Institute (buckley@rumford.com)

Revise as follows:

2113.19 Chimney clearances. Any portion of a masonry chimney located in the interior of the building or within the *exterior wall* of the building shall have a minimum airspace clearance to combustibles of 2 inches (51 mm). Chimneys located entirely outside the *exterior walls* of the building, including chimneys that pass through the soffit or cornice, shall have a minimum airspace clearance of 1 inch (25 mm). The airspace shall not be filled, except to provide noncombustible insulation and fireblocking in accordance with Section 2113.20.

Exceptions:

1. Masonry chimneys equipped with a chimney lining system *listed* and labeled for use in chimneys in contact with combustibles in accordance with UL 1777, and installed in accordance with the manufacturer's instructions, are permitted to have combustible material in contact with their exterior surfaces.
2. Where masonry chimneys are constructed as part of masonry or concrete walls, combustible materials shall not be in contact with the masonry or concrete wall less than ~~12 inches (305 mm)~~ 8 inches (204 mm) from the inside surface of the nearest flue lining.
3. Exposed combustible *trim* and the edges of sheathing materials, such as wood siding, are permitted to abut the masonry chimney sidewalls, in accordance with Figure 2113.19, provided such combustible *trim* or sheathing is a minimum of ~~12 inches (305 mm)~~ 8 inches (204 mm) from the inside surface of the nearest flue lining.
   Combustible material and *trim* shall not overlap the corners of the chimney by more than 1 inch (25 mm).

Reason: To allow non ombustible insulation in clearance to combustible spaces. It clears up confusion with the reference to fireblocking (which can be noncombustible insulation) and is what builders do anyway.

Changing the 12" of solid masonry to 8" where chimneys can be in contact with combustible trim or framing in a masonry wall is consistent with the relative wall thicknesses, historic experience and recent engineering studies.

Cost Impact: The code change proposal will not increase the cost of construction.

S237-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2113.9-S-BUCKLEY.doc

S238–12

202, 722.5.1, 722.5.1.1, 722.6.1.4, 722.5.1.4.1, 722.5.1.4.5, 722.5.2, 722.5.2.1, 722.5.2.2.1, 1615.3.2, 1809.11, 2205.1, 2205.2 (NEW), 2205.2.1 (NEW), 2205.2.1.1 (NEW), 2205.2.1.2 (NEW), 2205.2.2 (NEW), 2203.1, 2203.2, 2206.1, 2206.2, 2206.2.1 (NEW),

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction (bmanley@steel.org)

Revise as follows:

SECTION 202
DEFINITIONS

STEEL ~~MEMBER~~ ELEMENT, STRUCTURAL. Any steel structural member of a building or structure consisting of ~~a rolled steel structural shape~~ rolled shapes, pipe, hollow structural sections, plates, bars, sheets, rods or steel castings other than cold-formed steel, or steel joist members.

Revise as follows:

722.5.1 Structural steel columns. The *fire-resistance ratings* of structural steel columns shall be based on the size of the element and the type of protection provided in accordance with this section.

722.5.1.1 General. These procedures establish a basis for determining the *fire resistance* of column assemblies as a function of the thickness of fire-resistant material and, the weight, *W*, and heated perimeter, *D*, of structural steel columns. As used in these sections, *W* is the average weight of a structural steel column in pounds per linear foot. The heated perimeter, *D*, is the inside perimeter of the fire-resistant material in inches as illustrated in Figure 722.5.1(1).

722.5.1.4 Concrete-protected columns. The *fire resistance* of structural steel columns protected with concrete, as illustrated in Figure 722.5.1(6) (a) and (b), shall be permitted to be determined from the following expression:

$R = R_o(1 + 0.03_m)$ **(Equation 7-14)**

where:

$R_o = 10\ (W/D)^{0.7} + 17\ (h^{1.6}/k_c^{0.2}) \times [1 + 26\ \{H/p_c c_c h\ (L + h)\}^{0.8}]$

As used in these expressions:

R = Fire endurance at equilibrium moisture conditions (minutes).
R_o = Fire endurance at zero moisture content (minutes).
m = Equilibrium moisture content of the concrete by volume (percent).
W = Average weight of the structural steel column (pounds per linear foot).
D = Heated perimeter of the structural steel column (inches).
h = Thickness of the concrete cover (inches).
k_c = Ambient temperature thermal conductivity of the concrete (Btu/hr ft °F).
H = Ambient temperature thermal capacity of the structural steel column = 0.11W (Btu/ ft °F).
p_c = Concrete density (pounds per cubic foot).
c_c = Ambient temperature specific heat of concrete (Btu/lb °F).
L = Interior dimension of one side of a square concrete box protection (inches).

722.5.1.4.1 Reentrant space filled. For wide-flange <u>structural</u> steel columns completely encased in concrete with all reentrant spaces filled [Figure 722.5.1(6)(c)], the thermal capacity of the concrete within the reentrant spaces shall be permitted to be added to the thermal capacity of the steel column, as follows:

$H = 0.11\ W + (p_c c_c/144)\ (b_f d - A_s)$ **(Equation 7-15)**

where:

b_f = Flange width of the <u>structural</u> steel column (inches).
d = Depth of the <u>structural</u> steel column (inches).
A_s = Cross-sectional area of the steel column (square inches).

FIGURE 721.5.1(5)
WIDE FLANGE ~~STRUCTURE~~ <u>STRUCTURAL</u> STEEL COLUMNS WITH SPRAYED FIRE-RESISTANT MATERIALS

(No change to figure)

722.5.1.4.5 Masonry protection. The *fire resistance* of structural steel columns protected with concrete masonry units or clay masonry units as illustrated in Figure 722.5.1(7), shall be permitted to be determined from the following expression:

$R = 0.17\ (W/D)^{0.7} + [0.285\ (T_e^{1.6}/K^{0.2})]$
$[1.0 + 42.7\ \{(A_s/d_m\ T_e)/(0.25p + T_e)\}^{0.8}]$ **(Equation 7-16)**

where:

R = *Fire-resistance rating* of column assembly (hours).
W = Average weight of <u>structural</u> steel column (pounds per foot).
D = Heated perimeter of <u>structural</u> steel column (inches) [see Figure 722.5.1(7)].
T_e = Equivalent thickness of concrete or clay masonry unit (inches) (see Table 722.3.2 Note a or Section 722.4.1).
K = Thermal conductivity of concrete or clay masonry unit (Btu/hr · ft · °F) [see Table 722.5.1(3)].
A_s = Cross-sectional area of <u>structural</u> steel column (square inches).
d_m = Density of the concrete or clay masonry unit (pounds per cubic foot).
p = Inner perimeter of concrete or clay masonry protection (inches) [see Figure 722.5.1(7)].

722.5.2 Structural steel beams and girders. The *fire resistance ratings* of <u>structural</u> steel beams and girders shall be based upon the size of the element and the type of protection provided in accordance with this section.

722.5.2.1 Determination of *fire resistance*. These procedures establish a basis for determining resistance of structural steel beams and girders which differ in size from that specified in *approved* fire-resistance-rated assemblies as a function of the thickness of fire-resistant material and the weight (W) and heated perimeter (D) of the beam or girder. As used in these sections, W is the average weight of a ~~structural steel member~~ <u>*structural steel element*</u> in pounds per linear foot (plf). The heated perimeter, D, is the inside perimeter of the fire-resistant material in inches as illustrated in Figure 722.5.2.

722.5.2.2.1 Minimum thickness. The use of Equation 7-17 is subject to the following conditions:

1. The weight-to-heated-perimeter ratio for the substitute beam or girder (*W2/D2*) shall not be less than 0.37.
2. The thickness of fire protection materials calculated for the substitute beam or girder (*T1*) shall not be less than 3/8 inch (9.5 mm).
3. The unrestrained or restrained beam rating shall not be less than 1 hour.
4. When used to adjust the material thickness for a restrained beam, the use of this procedure is

limited to structural steel sections classified as compact in accordance with the ~~AISC~~ ~~*Specification for Structural Steel Buildings*,~~ (AISC 360-~~05~~).

Revise as follows:

1615.3.2 Structural steel, open web steel joist or joist girder, or composite steel and concrete frame structures. Frame structures constructed with a structural steel frame or a frame composed of open web steel joists, joist girders with or without other ~~structural steel elements~~ *structural steel elements* or a frame composed of composite steel or composite steel joists and reinforced concrete elements shall conform to the requirements of this section.

Revise as follows:

1809.11 Steel grillage footings. Grillage footings of ~~structural steel shapes~~ *structural steel elements* shall be separated with *approved* steel spacers and be entirely encased in concrete with at least 6 inches (152 mm) on the bottom and at least 4 inches (102 mm) at all other points. The spaces between the shapes shall be completely filled with concrete or cement grout.

Revise as follows:

2203.1 Identification. Identification of ~~structural steel members~~ *structural steel elements* shall comply with the requirements contained in AISC 360. Identification of cold-formed steel members shall comply with the requirements contained in AISI S100. Identification of cold-formed steel light-frame construction shall also comply with the requirements contained in AISI S200. Other steel furnished for structural load-carrying purposes shall be properly identified for conformity to the ordered grade in accordance with the specified ASTM standard or other specification and the provisions of this chapter. Steel that is not readily identifiable as to grade from marking and test records shall be tested to determine conformity to such standards.

2203.2 Protection. Painting of ~~structural steel members~~ *structural steel elements* shall comply with the requirements contained in AISC 360. Painting of open-web steel joists and joist girders shall comply with the requirements of SJI CJ-1.0, SJI JG-1.1, SJI K-1.1 and SJI LH/DLH-1.1. Individual structural members and assembled panels of cold-formed steel construction shall be protected against corrosion in accordance with the requirements contained in AISI S100. Protection of cold-formed steel light-frame construction shall also comply with the requirements contained in AISI S200.

2205.1 General. The design, fabrication and erection of *structural steel elements* in ~~for~~ buildings, ~~and~~ structures, and portions thereof shall be in accordance with AISC 360. ~~Where required, the seismic design of structural steel structures shall be in accordance with the additional provisions of Section 2205.2.~~

2205.2 Seismic design. Where required, the seismic design, fabrication and erection of buildings, structures, and portions thereof shall be in accordance with Sections 2205.2.1 or 2205.2.2, as applicable.

2205.2.1 ~~**Seismic requirements for structural steel structures**~~ **Structural steel seismic-force resisting systems.** The design, fabrication and erection of structural steel ~~structures to resist seismic forces~~ seismic-force resisting systems shall be in accordance with the provisions of Section ~~2205.2.1~~ 2205.2.1.1 or ~~2205.2.2~~ 2205.2.1.2, as applicable.

~~**2205.2.1**~~ **2205.2.1.1 Seismic Design Category B or C.** ~~Structural steel~~ Structures assigned to *Seismic Design Category* B or C shall be of any construction permitted in Section 2205. Where a response modification coefficient, R, in accordance with ASCE 7, Table 12.2-1 is used for the design of ~~structural steel~~ structures assigned to *Seismic Design Category* B or C, the structures shall be designed and detailed in accordance with the requirements of AISC 341.

Exception: The response modification coefficient, R, designated for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems" in ASCE 7, Table 12.2-1 shall be permitted for systems designed and detailed in accordance with AISC 360, and need not be designed and detailed in accordance with AISC 341.

<u>2205.2.2</u> **Seismic Design Category D, E or F.** ~~Structural steel~~ Structures assigned to *Seismic Design Category* D, E or F shall be designed and detailed in accordance with AISC 341, except as permitted in ASCE 7, Table 15.4-1.

<u>**2205.2.2 Structural steel elements.** The design, fabrication and erection of *structural steel elements* in seismic-force resisting systems other than those covered in Section 2205.2.1, including struts, collectors, chords and foundation elements, shall be designed and detailed in accordance with AISC 341 if:</u>

1. <u>The structure is assigned to Seismic Design Category D, E or F, except as permitted in ASCE 7, Table 15.4-1.</u>
2. <u>A response modification coefficient, R, greater than 3 in accordance with ASCE 7, Table 12.2-1 is used for the design of the structure assigned to Seismic Design Category B or C.</u>

2206.1 General. Systems of ~~structural steel~~ <u>*structural steel elements*</u> acting compositely with reinforced concrete shall be designed in accordance with AISC 360 and ACI 318, excluding ACI 318 Chapter 22. ~~Where required, the seismic design of composite steel and concrete systems shall be in accordance with the additional provisions of Section 2206.2.~~

<u>**2206.2 Seismic design.** Where required, the seismic design, fabrication and erection of composite steel and concrete systems shall be in accordance with the additional provisions of this section.</u>

~~2206.2~~ <u>2206.2.1</u> **Seismic requirements for composite structural steel and concrete construction.** Where a response modification coefficient, R, in accordance with ASCE 7, Table 12.2-1 is used for the design of systems of structural steel acting compositely with reinforced concrete, the structures shall be designed and detailed in accordance with the requirements of AISC 341.

Reason: This comprehensive proposal not only makes a number of editorial modifications for clarification purposes, it also introduces into Chapter 22 the term and associated requirements for "structural steel elements" and carries that change throughout the remainder of the IBC, as necessary. Note that the Chapter 17 proposal introducing this term is handled in a separate, companion proposal. Please refer to it for additional background.

The purpose of introducing this new term and its associated requirements is to ensure that the wide range of structural steel components in buildings, structures and portions thereof are appropriately covered for design, fabrication and erection. Concerns have been expressed by the structural engineering community regarding the limited definition of *structural steel* contained in AISC 360-10:

> *Structural steel.* Steel elements as defined in Section 2.1 of the AISC *Code of Standard Practice for Steel Buildings and Bridges (AISC COSP).*

Section 2.1 of AISC COSP goes on to list many items that are considered structural steel, and Section 2.1 identifies those items that are specifically excluded from the definition. However, these provisions in AISC COSP are intended to provide a default separation of scope between the work of the structural steel fabricator and erector, and the entity providing miscellaneous iron and steel.

Thus, the AISC COSP provides a definition of *structural steel* for default trade practices. Upon reflection, this is not an ideal definition for use in a model building code. To rectify this situation, this proposal introduces the defined term "structural steel element". The specific change from "member" to "element" was to get away from the confusion caused by the difference between the general term, "steel structural member", and the specific AISC-related term, "structural steel member", used throughout the code. Also, language was added clarifying the types of rolled product that fall under this category of steel construction.

Once the definition was settled upon, the new term was integrated into Section 2205. In Section 2205.1, the intent is for all structural steel elements to be designed, fabricated and erected in accordance with AISC 360. Within the seismic design section, the distinction was drawn between structural steel seismic-force resisting systems, which refer to the sixteen structural steel systems currently listed in ASCE 7-10, Table 12.2-1, and structural steel elements that work as struts, collectors, chords and foundation elements in seismic-force resisting systems composed primarily of other structural materials. These structural steel elements are intended to be designed and detailed in accordance with AISC 341, if they are used in a structural in a high seismic area (SDC D, E or F) or they are utilized in a system that relies heavily on non-elastic energy dissipation, in this case chosen to be a system with a response modification coefficient, R, greater than 3.

The remainder of this proposal simply carries the newly defined term through the rest of the IBC.

Cost Impact:.No impact to the cost of construction is anticipated.

S238-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-STEEL MEMBER, STRUCTURAL-G-MANLEY

S239–12
2204.1, 2204.2, 2204.2.1

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

2204.1 Welding. The details of design, workmanship and technique for welding, ~~inspection of welding~~ and qualification of welding ~~operators~~ personnel shall conform to the requirements of the specifications listed in Sections 2205, 2206, 2207, 2208, 2210 and 2211. For s*pecial inspection* of welding, see ~~shall be provided where required by~~ Section ~~1705~~ 1705.2.

2204.2 Bolting. The design, installation and inspection of bolts shall be in accordance with the requirements of the specifications listed in Sections 2205, 2206, 2207, 2210 and 2211. For *special inspection* of the installation of high-strength bolts ~~shall be provided where required by~~ see Section ~~1705~~ 1705.2.

~~2204.2.1~~ 2204.3 Anchor rods. Anchor rods shall be set in accordance with the *construction documents*. The protrusion of the threaded ends through the connected material shall fully engage the threads of the nuts, but shall not be greater than the length of the threads on the bolts.

Reason: These changes are editorial in nature and include the following:

- Clarification of the relationship between the standards referenced in Chapter 22 and the requirements for special inspection in Chapter 17
- Deletion of the term "operators" in favor of the term "personnel". The term "operators" excludes welders and tack welders as defined by AWS D1.1. "Personnel" is the more inclusive term.
- Modification of the hierarchy with regard to Anchor Rods. Anchor rods are not bolts. They are rods. They should not be a subsection of bolting, but rather stand on their own.

Cost Impact: The code change proposal will not increase the cost of construction.

S239-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2204.1-S-MANLEY.doc

S240–12
1604.3.3, 2203.2, 2207.1, 2207.1.1 (NEW), 2207.2, 2207.3, 2207.4, 2207.5,

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute, representing Steel Joist Institute (bmanley@steel.org)

Revise as follows:

1604.3.3 Steel. The deflection of steel structural members shall not exceed that permitted by AISC 360, AISI S100, ASCE 8, SJI CJ~~-1.0~~, SJI JG~~-1.1~~, SJI K~~-1.1~~ or SJI LH/ DLH~~-1.1~~, as applicable.

2203.2 Protection. Painting of structural steel members shall comply with the requirements contained in AISC 360. Painting of open-web steel joists and joist girders shall comply with the requirements of SJI CJ~~-1.0~~, SJI JG~~-1.1~~, SJI K-1.1 and SJI LH/DLH~~-1.1~~. Individual structural members and assembled panels of cold-formed steel construction shall be protected against corrosion in accordance with the requirements contained in AISI S100. Protection of cold-formed steel light-frame construction shall also comply with the requirements contained in AISI S200.

2207.1 General. The design, manufacture and use of open web steel joists and joist girders shall be in accordance with one of the following Steel Joist Institute (SJI) specifications:

1. SJI-CJ~~-1.0~~
2. SJI-K~~-1.1~~
3. SJI-LH/DLH~~-1.1~~
4. SJI-JG~~-1.1~~

<u>**2207.1.1 Seismic design.**</u> <u>Where required, the seismic design of buildings shall be in accordance with the additional provisions of Section 2205.2 or 2211.6.</u>

2207.2 Design. The *registered design professional* shall indicate on the *construction documents* the steel joist and/or steel joist girder designations from the specifications listed in Section 2207.1 and shall indicate the requirements for joist and joist girder design, layout, end supports, anchorage~~, non-SJI standard~~ bridging, bridging termination connections and bearing connection design to resist uplift and lateral loads. These documents shall indicate special requirements as follows:

1. Special loads including:
   - 1.1. Concentrated loads;
   - 1.2. Nonuniform loads;
   - 1.3. Net uplift loads;
   - 1.4. Axial loads;
   - 1.5. End moments; and
   - 1.6. Connection forces.
2. Special considerations including:
   - 2.1. Profiles for ~~nonstandard~~ joist and joist girder configurations ~~(standard joist and joist girder are as indicated in the SJI catalog)~~ <u>that differ from those defined by the SJI specifications listed in Section 2207.1</u>;
   - 2.2. Oversized or other nonstandard web openings; and
   - 2.3. Extended ends.
3. <u>Live load</u> deflection criteria ~~for live and total loads~~ for ~~non-SJI standard joists~~ <u>and joist girder configurations that differ from those defined by the SJI specifications listed in Section 2207.1</u>.

2207.3 Calculations. The steel joist and joist girder manufacturer shall design the steel joists and/or steel joist girders in accordance with the ~~current~~ SJI specifications ~~and load tables~~ <u>listed in Section 2207.1</u> to support the load requirements of Section 2207.2. The *registered design professional* ~~may~~ <u>shall be permitted to</u> require submission of the steel joist and joist girder calculations as prepared by a *registered* *design professional* responsible for the product design. If requested by the *registered design professional*, the steel joist manufacturer shall submit design calculations with a cover letter bearing the seal and signature of the joist manufacturer's *registered design professional*. In addition to ~~standard~~ the design calculations submitted under ~~this~~ seal and signature, ~~submittal~~ of the following shall be included:

1. ~~Non-SJI standard~~ Bridging ~~details~~ design that differs from the SJI specifications listed in Section 2207.1 (e.g.for cantilevered conditions, net uplift, etc.).
2. Connection ~~details~~ design for:
   2.1. ~~Non-SJI standar~~ Connections that differ from the SJI specifications listed in Section 2207.1 (e.g.flushframed or framed connections);
   2.2. Field splices; and
   2.3. Joist headers.

2207.4 Steel joist drawings. Steel joist placement plans shall be provided to show the steel joist products as specified on the *construction documents* and are to be utilized for field installation in accordance with specific project requirements as stated in Section 2207.2. Steel joist placement plans shall include, at a minimum, the following:

1. Listing of all applicable loads as stated in Section 2207.2 and used in the design of the steel joists and joist girders as specified in the *construction documents*.
2. Profiles for ~~nonstandard~~ joist and joist girder configurations ~~(standard joist and joist girder configurations are as indicated in the SJI catalog)~~ that differ from those defined by the SJI specifications listed in Section 2207.1.
3. Connection requirements for:
   3.1. Joist supports;
   3.2. Joist girder supports;
   3.3. Field splices; and
   3.4. Bridging attachments.
4. Live and total load deflection criteria ~~for live and total loads~~ for ~~non-SJI standard joists~~ and joist girder configurations that differ from those defined by the SJI specifications listed in Section 2207.1.
5. Size, location and connections for all bridging.
6. Joist headers.

Steel joist placement plans do not require the seal and signature of the joist manufacturer's *registered design professional*.

2207.5 Certification. At completion of manufacture, the steel joist manufacturer shall submit a *certificate of compliance* in accordance with Section 1704.2.5.2 stating that work was performed in accordance with *approved construction documents* and with SJI ~~standard~~ specifications listed in Section 2207.1.

Reason: This code change is primarily editorial in nature with the intent to clarify and streamline the requirements for steel joists. Major changes include the following:
- Correction of short titles in Section 2207.1, 1604.3.3 and 2203.2 to reflect the appropriate short title listing in Chapter 35 and correction of SJI address in Chapter 35.
- Deletion of reference to the SJI catalog – it is not an adopted reference.
- Deletion of reference to the load tables; they are now incorporated into the relevant SJI specifications.
- Elimination of the vague terms "nonstandard", "non SJI standard", and "standard" used throughout the section. These terms are not defined. To clarify what is intended, a reference to the requirements found in the SJI specifications listed in Section 2207.1 is substituted.

Addition of "joist girders" to Section 2207.2, Item 3 and Section 2207.4, Item 4 for consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

S240-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2207.1-S-MANLEY.doc

S241–12
2207.4

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute, representing Steel Joist Institute (bmanley@steel.org)

Revise as follows:

2207.4 Steel joist drawings. Steel joist placement plans shall be provided to show the steel joist products as specified on the *construction documents* and are to be utilized for field installation in accordance with specific project requirements as stated in Section 2207.2. Steel placement plans shall include, at a minimum, the following:

1. Listing of all applicable loads as stated in Section 2207.2 and used in the design of the steel joists and joist girders as specified in the *construction documents*.
2. Profiles for nonstandard joist and joist girder configurations (standard joist and joist girder configurations are as indicated in the SJI catalog).
3. Connection requirements for:
   3.1. Joist supports;
   3.2. Joist girder supports;
   3.3. Field splices; and
   3.4. Bridging attachments.
4. Deflection criteria for live and total loads for non-SJI standard joists.
5. Size, location and connections for all bridging.
6. Joist headers.

~~Steel joist placement plans do not require the seal and signature of the~~ The joist manufacturer's *registered design professional* shall not be required to sign and seal the steel joist placement plans.

Reason: This code change is editorial in nature, with the intent of correcting the grammar of the sentence.

Cost Impact: The code change proposal will not increase the cost of construction.

S241-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2207.4-S-MANLEY.doc

S242–12
2207.4

Proponent: George R. Stevenson, Jr., S.E., Structural Concepts, Inc., representing Structural Engineers Association of Arizona (gstevenson@scice.com)

Revise as follows:

2207.4 Steel joist drawings. Steel joist placement plans shall be provided to show the steel joist products as specified on the *construction documents* and are to be utilized for field installation in accordance with specific project requirements as stated in Section 2207.2. Steel placement plans shall include, at a minimum, the following:

1. Listing of all applicable loads as stated in Section 2207.2 and used in the design of the steel joists and joist girders as specified in the *construction documents*.
2. Profiles for nonstandard joist and joist girder configurations (standard joist and joist girder configurations are as indicated in the SJI catalog).
3. Connection requirements for:
   3.1. Joist supports;
   3.2. Joist girder supports;
   3.3. Field splices; and
   3.4. Bridging attachments.
4. Deflection criteria for live and total loads for non-SJI standard joists.
5. Size, location and connections for all bridging.
6. Joist headers.

~~Steel joist placement plans do not require the seal and signature of the joist manufacturer's *registered design professional*.~~ If required by the *registered design professional in responsible charge,* the steel joist manufacturer shall submit steel joist drawings bearing the seal and signature of the joist manufacturer's *registered design professional*.

Reason: The sentence deleted above was first included in the 2006 IBC and has caused widespread havoc for structural engineers checking submittals for steel joists since that time. For many decades, it has been customary and necessary for the registered design professional in responsible charge (or engineer of record - EOR) to specify that the joist manufacturer provide structural calculations and joist drawings signed and sealed by their registered design professional. Since 2006, the deleted sentence has commonly been cited by joist suppliers as code-sanctioned grounds why they no longer need to provide signed and sealed joist drawings even if the EOR has specified the requirement. This proposed modification will clarify the code so as to not interfere with submittal requirements specified by the EOR. The language is consistent with that in section 2207.3 for required seals on joist calculations.

As background information, the verification of specified joist loading is one of the most important items to be checked in a joist submittal. The joist loading is typically clearly shown on the joist drawings as required by section 2207.4.1. But, per current code, the joist drawings need not be sealed by the joist engineer; the joist engineer only seals the calculations, which do not clearly show joist loading. Because the calculations and joist drawings are not both sealed by the joist engineer, there is no link between them and it is very difficult for the EOR to determine if the joist engineer used the correct loading by looking at the calculations only, which are typically printouts of some proprietary calculation software. This leads to a safety issue because the joist design cannot be adequately reviewed or verified by the EOR.

Cost Impact: The code change proposal will not increase the cost of construction. No additional work is required.

S242-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2207.4-S-STEVENSON

S243–12
2209.1

Proponent: Victor D. Azzi, P.E., Consulting Structural Engineer, representing the Rack Manufacturers Institute (victorazzi@comcast.net)

Revise as follows:

2209.1 Storage racks. The design, testing and utilization of industrial steel storage racks made of cold-formed or hot-rolled steel structural members, shall be in accordance with RMI/ANSI MH 16.1. Where required by ASCE 7, the seismic design of storage racks shall be in accordance with the provisions of Section 15.5.3 of ASCE 7~~, except that the mapped acceleration parameters,~~ ~~S_s and S_1, shall be determined in accordance with Section 1613.3.1~~.

Reason: The new USGS maps, and the mapped acceleration parameters included in IBC Section 1613.3.1, are included in the new 2011 edition of the RMI/ANSI MH 16.1 standard, as well as in the ASCE 7-2010 and Supplement 1. The new RMI Standard, which is included by reference in the ASCE 7, also includes clarification of Load Combinations (including vertical seismic effects), Redundancy Factors, Minimum Seismic Force for Above-Grade Installations, Beam-to-Column Rotational Capacity and Testing, and Periodic Inspection.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This code change proposal references RMI standard MH16.1, which is already referenced in this code. However, the proposed change to code text is written to correlate with a new edition of the standard MH16.1-11 rather than the edition presently referenced in the code, which is the -08 edition. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved, the code text will revert to the text as it appears in the 2012 Edition of the Code.

S243-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2209.1-S-AZZI.doc

S244–12
2210.1.1.3 (NEW), Chapter 35 (NEW)

Proponent: Thomas Sputo, Ph.D., P.E., S.E., Steel Deck Institute

Add new text as follows:

2210.1.1.3 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be permitted to be designed and constructed in accordance with SDI-C.

Add new standard to Chapter 35 as follows:

SDI

SDI-C-2011 Standard for Composite Steel Floor Deck Slabs

Reason: This Standard contains provisions for the design and construction of composite steel deck-slabs of concrete on composite steel deck, and reflects current design and construction industry practices.

The 2012 IBC contains no provisions for the design of composite slabs on steel deck. The previous reference standard that was contained in the 2009 IBC was deleted from the 2012 IBC. Designers and code officials currently must rely on Section 104.11 of the IBC to use this very common structural system. Adding this Standard to the 2015 IBC would fill this gap.

This Standard is an update to the previous 2006 version of this Standard, and was developed and approved through a consensus process under ANSI guidelines, and complies with ICC CP 28. This Standard, along with all other Steel Deck Institute (SDI) Standards, will be available for free download from the SDI website for all parties.

For review purposes, the SDI C-2011 Standard that is being proposed is available for download and review from this website: http://www.sputoandlammert.com/standard.html

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S244-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2210.1.1.3 (NEW)-S-SPUTO

S245–12

2201.1, 2203.1, 2203.2, 2211.1, 2211.4, Table 2506.2, Table 2507.2, Chapter 35

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute (bmanley@steel.org)

Revise as follows:

2201.1 Scope. The provisions of this chapter govern the quality, design, fabrication and erection of steel ~~used structurally in buildings or structures~~ construction.

2203.1 Identification. Identification of structural steel members shall comply with the requirements contained in AISC 360. Identification of cold-formed steel members shall comply with the requirements contained in AISI S100. Identification of cold-formed steel light-frame construction shall also comply with the requirements contained in AISI S200 or AISI S220, as applicable. Other steel furnished for structural load-carrying purposes shall be properly identified for conformity to the ordered grade in accordance with the specified ASTM standard or other specification and the provisions of this chapter. Steel that is not readily identifiable as to grade from marking and test records shall be tested to determine conformity to such standards.

2203.2 Protection. Painting of structural steel members shall comply with the requirements contained in AISC 360. Painting of open-web steel joists and joist girders shall comply with the requirements of SJI CJ-1.0, SJI JG-1.1, SJI K-1.1 and SJI LH/DLH-1.1. Individual structural members and assembled panels of cold-formed steel construction shall be protected against corrosion in accordance with the requirements contained in AISI S100. Protection of cold-formed steel light-frame construction shall also comply with the requirements contained in AISI S200 or AISI S220, as applicable.

2211.1 General. The design and installation of structural members and nonstructural members utilized in cold-formed steel light-frame construction where the specified minimum base steel thickness is ~~between 0.0179 inches (0.455 mm) and~~ not greater than 0.1180 inches (2.997 mm) shall be in accordance with AISI S200 and Sections 2211.2 through 2211.7, or AISI S220, as applicable.

2211.4 Structural wall stud design. Structural wall studs shall be designed in accordance with either AISI S211 or AISI S100.

Revise as follows:

TABLE 2506.2
GYPSUM BOARD MATERIALS AND ACCESSORIES

MATERIAL	STANDARD
~~Steel studs, load-bearing~~ Cold-formed steel studs and track, structural	AISI S200 and ASTM C955,Section 8
~~Steel studs, nonload-bearing~~ Cold-formed steel studs and track, nonstructural	AISI S220 and ASTM C645, Section 10

(Portions of Table not shown remain unchanged)

TABLE 2507.2
LATH, PLASTERING MATERIALS AND ACCESSORIES

MATERIAL	STANDARD
~~Steel studs and track~~ Cold-formed steel studs and track, structural	~~ASTM C 645~~ AISI S200 and; ASTM C 955,Section 8
Cold-formed steel studs and track, nonstructural	AISI S200 and ASTM C645, Section 10

(Portions of Table not shown remain unchanged)

Add new standard to Chapter 35 as follows:

AISI

AISI S220—11 North American Standard for Cold-formed Steel Framing-Nonstructural Members

Reason: This proposal represents the results of a major effort to synchronize and coordinate the industry standards related to cold-formed steel framing. ASTM Committees C11 and A05, and AISI have been working within the steel framing industry on this "Code Synchronization" effort, the goal of which is to organize and maintain a single path for the building code requirements of cold-formed steel light frame construction products. To this end, a new document, AISI S220, was developed to contain all the necessary requirements for nonstructural products. AISI S220 represents a clarification and coordination of industry requirements. The Steel Framing Industry Association (SFIA), the Steel Stud Manufacturers Association (SSMA), the Association of the Wall and Ceiling Industry (AWCI), and the Gypsum Association (GA) all participated in this effort.

The proper integration of AISI S220 into the IBC requires the following changes:

- Section 2201.1: The scope of this chapter now includes products that are non-structural. Therefore, the statement has been simplified to reflect the broad spectrum of steel construction.
- Section 2203: AISI S220, Section A6.5 includes requirements that cover the identification and protection of nonstructural cold-formed steel framing.
- Section 2211.1: Because of the addition of the reference for nonstructural cold-formed steel framing, the lower limit of the minimum base thickness has been deleted.
- Section 2211.4: The charging language to AISI S211 has been clarified to reflect the distinction between AISI S211 and AISI S220.
- Table 2506.2: The material column has been clarified to refer to "structural" and "nonstructural" CFS studs and track. Additionally, AISI S200 and AISI S220 have been incorporated into the table as the primary references. Only ASTM C645 Section 10, and ASTM C955 Section 8, which cover the requirements for the Penetration Test for screws, have been retained. These sections provide a procedure for evaluating the member's ability to pull the head of a screw below the surface of gypsum sheathing. At this time, AISI S220 does not include this test. Future editions may include it, allowing for the eventual deletion of the specific references to ASTM C645 and C955. AISI S200 and AISI S220 incorporate the material and manufacturing provisions previously included in ASTM C955 and ASTM C645 respectively. Limiting the specific references to ASTM C645 Section 10 and C955 Section 8 removes the "dual paths to code compliance", which has caused confusion in the cold-formed steel framing industry.
- Table 2507.2: Entries match what is contained in Table 2506.2.
- Chapter 35: Reflects the necessary changes to the referenced standards.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S245-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2201.1-S-MANLEY.doc

S246–12
2301.2, 2308.1, 2309 (NEW)

Proponent: Paul Coats, PE, CBO, American Wood Council (pcoats@awc.org)

Revise as follows:

2301.2 General design requirements. The design of structural elements or systems, constructed partially or wholly of wood or wood-based products, shall be in accordance with one of the following methods:

1. *Allowable stress design* in accordance with Sections 2304, 2305 and 2306.
2. *Load and resistance factor design* in accordance with Sections 2304, 2305 and 2307.
3. *Conventional light-frame construction* in accordance with Sections 2304 and 2308.

   ~~**Exception:** Buildings designed in accordance with the provisions of the AF&PA WFCM shall be deemed to meet the requirements of the provisions of Section 2308.~~

4. WFCM in accordance with Section 2309
~~4~~5. The design and construction of log structures shall be in accordance with the provisions of ICC 400.

2308.1 General. The requirements of this section are intended for *conventional light-frame construction*. Other methods are permitted to be used, provided a satisfactory design is submitted showing compliance with other provisions of this code. Interior nonload-bearing partitions, ceilings and curtain walls of *conventional light-frame construction* are not subject to the limitations of this section~~. Alternatively, compliance with AF&PA WFCM shall be permitted subject to the limitations therein and the limitations of this code.~~ Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three *stories above grade plane* in height with a separate *means of egress* and their accessory structures shall comply with the *International Residential Code*.

SECTION 2309
WOOD FRAME CONSTRUCTION MANUAL

2309.1 WFCM. Structural design in accordance with the WFCM shall be permitted for buildings in any use group subject to the limitations of Section 1.1.3 of the WFCM and the load assumptions contained therein. Structural elements beyond these limitations shall be designed in accordance with accepted engineering practice.

Reason: The WFCM is a consensus document that contains both engineering criteria and engineered prescriptive provisions for wood frame construction. It is an ANSI standard developed by technical committees organized by the American Wood Council and it is already referenced in the code for the design of wood frame structures within its scope.

Item #1 revises the manner in which the WFCM is referenced by removing its association with conventional constructions provisions of 2308. The proposed revision in 2301.2 recognizes WFCM as a separate design method.

Item #2 removes the reference to WFCM as an alternative in Section 2308.1 because it is no longer needed and may lead to confusion about its applicability in accordance with its own applicability limits rather than the limits for conventional construction listed in 2308.2.

Item #3 incorporates reference to WFCM under a new 2309 section, and states clearly that the WFCM may be used for buildings of any use group that fit within the WFCM's applicability limits for building size, configuration, and loads as set out in Section 1.1.3 of the standard.

While WFCM provisions are intended primarily for detached one-and two-family dwellings due to the floor live load assumption associated with those occupancies, many of the WFCM provisions for specific geographic wind, seismic, and snow loads may remain applicable for other buildings. For example, wind provisions for sizing of roof sheathing, wall sheathing, fastening schedule, uplift straps, shear anchorage, shear wall lengths, and wall studs for out of plane wind loads are included in WFCM and are applicable for other use groups within the load limitations of the WFCM tables. Similarly, roof rafter size and spacing for heavy snow, and shear wall lengths and anchorage for seismic are applicable within the load limitations of the WFCM tables. Applications outside the scope of the WFCM tabulated requirements, such as floor joist design for 60 psf loading and design of supporting gravity elements for the additional floor live load is beyond the applicability of the WFCM and must be designed in accordance with accepted engineering practice. This parallels the approach taken in Section R301.1.3 of the IRC, which permits unconventional elements of one and two-family dwellings to be designed per the IBC. This change will expand the availability of engineered but prescriptive options for design of wood frame commercial buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

S246-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2301.2-S-COATS.doc

S247–12
202 (NEW), 2303.1.12 (NEW), Chapter 35 (New)

Proponent: Edward L. Keith, APA – The Engineered Wood Association (ed.keith@apawood.org)

Add new text as follows:

CROSS-LAMINATED TIMBER. A prefabricated engineered-wood product consisting of at least three layers of solid-sawn lumber or structural composite lumber where the adjacent layers are cross-oriented and bonded with structural adhesive to form a solid wood element.

Add new text as follows:

2303.1.12 Cross-laminated timber. Cross-laminated timber (CLT) shall conform to ANSI/APA PRG 320. Cross-laminated timber shall be identified by grade, thickness, and mill name or identification number by marks provided by an approved testing or grading agency indicating conformance to the referenced standard.

Add new standard to Chapter 35 as follows:

APA

ANSI/APA PRG 320-2011 Standard for Performance-Rated Cross-Laminated Timbers

Reason: While new to the North America, cross-laminated timber (CLT) construction is a well established building system in Europe. This system is made up of solid wood slabs up to 52 feet long, 9 feet wide, and 12 inches thick. Cross-laminated like plywood from lumber planks, CLT has a minimum of 3 layers. (Think plywood on a grand scale!)

These timbers come in a number of configurations suitable for wall, roof and/or floor applications. Due to their makeup, these wall-size timbers can be used in heavy timber construction and have exceptional in plane (shear walls and bracing) and out of plane (wind) strength and stiffness. Having essentially no inside cavities and being solid throughout, air infiltration and inner-wall condensation are essentially eliminated. Being wall sized, these timbers came to the jobsite with all openings pre-cut and erection times are just a fraction of those for conventional construction.

In parallel with the research and development work being conducted in North America, the APA completed the development of an ANSI product standard. A National Design Specification (NDS) supplement is currently under development and several test projects are underway in North America.

Additional information is available at:
http://www.woodworks.org/files/PDF/Presentations/SE-Nov-2010/Mohammad.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

S247-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CROSS LAMINATED TIMBER (NEW)-G-KEITH

S248–12
202 (NEW), 2303.1.12 (NEW), Chapter 35 (NEW)

Proponent: Brad Douglas, American Wood Council

Add new text as follows:

SECTION 202
DEFINITIONS

ENGINEERED WOOD RIM BOARD. A full-depth structural composite lumber, wood structural panel, structural glued laminated timber, or pre-fabricated wood I-joist member designed to transfer horizontal (shear) and vertical (compression) loads, provide attachment for diaphragm sheathing, siding and exterior deck ledgers, and provide lateral support at the ends of floor or roof joists or rafters.

Add new text as follows:

2303.1.12 Engineered wood rim board. Engineered wood rim boards shall conform to ANSI/APA PRR 410 or shall be evaluated in accordance with ASTM D 7672. Structural capacities shall be in accordance with ANSI/APA PRR 410 or established in accordance with ASTM D 7672. Rim boards conforming to ANSI/APA PRR 410 shall be marked in accordance with that standard.

Add new standards to Chapter 35 as follows:

ANSI

ANSI/APA PRR 410-2011 Standard for Performance-Rated Engineered Wood Rim Boards

ASTM

ASTM D 7672-2011e1 Standard Specifications for Evaluating Structural Capacities of Rim Board Products and Assemblies

Reason: Engineered rim board is a key structural element in many engineered wood floor applications where both structural load path through the perimeter member and dimensional change compatibility are design considerations. Two new consensus standards address products intended for engineered wood rim board applications. While both ANSI/APA PRR 410 and ASTM D7672 standards address the fundamental requirements for testing and evaluation of engineered rim board, PRR 410 also includes performance categories for engineered wood products used in engineered rim board applications. Under PRR 410, products are assigned a grade based on performance category (e.g. categories based on structural capacity) and will bear a mark in accordance with the grade. In contrast, ASTM D7672 is applicable for determination of product specific rim board performance (i.e. structural capacities) for engineered wood products that may be recognized in manufacturer's literature or product evaluation reports.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S248-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-ENGINEERED WOOD RIM BOARD (NEW)-G-COATS

S249–12

202 (NEW), 2303.1.2 (NEW), Chapter 35 (NEW)

Proponent: Edward L. Keith, P.E., APA – The Engineered Wood Association (ed.keith@apawood.org)

Add new text as follows:

SECTION 202
DEFINITIONS

ENGINEERED WOOD RIM JOIST/RIM BOARD. A full-depth structural composite lumber, wood structural panel, structural glued laminated timber, or pre-fabricated wood I-joist member designed to transfer horizontal (shear) and vertical (compression) loads, provide attachment for diaphragm sheathing, siding and exterior deck ledgers, and provide lateral support at the ends of floor or roof joists or rafters.

Add new text as follows:

2303.1.12 Engineered wood rim joist/rim board. Engineered wood rim joists shall conform to ANSI/APA PRR 410 or shall be evaluated in accordance with ASTM D 7672. Engineered wood rim joists conforming to ANSI/APA PRR 410 shall be identified by marks provided by an approved testing or grading agency indicating conformance to the referenced standard.

Add new standard to Chapter 35 as follows:

APA

ANSI/APA PRR 410-2011-Standard for Performance Rated Engineered Wood Rim Boards

ASTM

ASTM D 7672-2011e1-Standard Specification for Evaluating Structural Capacities of Rim Board Products and Assemblies

Reason: With the acceptance of engineered wood floor joists and beams into modern building systems, it had become increasingly important to match the physical properties of the various wood systems used in parallel load paths. The rim joist is a good example in that a solid sawn lumber rim joist should not be used in conjunction with engineered wood floor joists. The engineered wood floor joists are often dry when they are placed in the building system and subject to very little shrinkage as they reach equilibrium moisture content with the completed building system. As such it is imperative that a rim joist product with similar physical properties be used in conjunction with the engineered wood floor joists.

Lumber is normally delivered to the jobsite at a moisture content of from 16 to 18%. As the lumber rim joist dries out and reaches equilibrium moisture content of 8 – 10%, it can shrink by as much as ½". As the lumber rim joist shrinks away from the top of the engineered wood framing all of the vertical loads carried by the rim joist are effectively redistributed to the floor joists and other framing members, not designed for the extra load. For this reason, as well as the resource utilization advantages of engineered wood products, engineered wood rim joists have been produced and sold as compatible sizes to other popular engineered wood products, such as prefabricated wood I-joists. Up until now each of these rim joist products has been manufactured to proprietary standards or no standards at all. The building official was left without any guidance from the building code on the acceptability of these very common produces. Two new consensus-based standards, the ANSI/APA PRR 410 and ASTM D7672, have been developed by industry to correct this discrepancy. The ANSI/APA PRR 410 Standard was developed to provide a vehicle whereby commodity engineered wood rim joists can be manufactured and the ASTM D7672 Standard provides procedures for testing and establishing the structural capacities of proprietary rim joist products.

Voting to accept this consensus-based standard will make the building officials' job easier, provide for better and safer structures to the consumer, promote the use of "Green" materials as well as reducing the regulatory burden for the commodity product manufacturers.

Cost Impact: The code change proposal will not increase the cost of construction.

S249-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-ENGINEERED WOOD RIM JOIST-RIM BOARD (NEW)-G-KEITH

S250–12
202 (NEW), 2303.1.4 (NEW), Chapter 35 (NEW)

Proponent: Sam Francis, representing American Wood Council (sfrancis@awc.org)

Add new definition as follows:

SECTION 202
DEFINITIONS

CROSS-LAMINATED TIMBER. A prefabricated engineered wood product consisting of at least three layers of solid-sawn lumber or *structural composite lumber* where the adjacent layers are cross-oriented and bonded with structural adhesive to form a solid wood element.

Add new text as follows:

2303.1.4 Structural glued cross-laminated timber. Cross-laminated timbers shall be manufactured and identified as required in ANSI/APA PRG 320-2011.

Add new standard to Chapter 35 as follows:

ANSI

ANSI/APA PRG 320-2011 Standard for Performance-Rated Cross-Laminated Timber

Reason: Cross-Laminated Timber (CLT) is a new product in North America. First developed in Europe nearly 20 years ago, it is used extensively in Europe. A new North American product manufacturing standard, ANSI/APA PRG 320-2011, has just been completed. This large section, engineered wood product should be defined by the code, and it should conform to the newly developed consensus manufacturing standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S250-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2303.1.4 (NEW)-S-FRANCIS.doc

S251–12
2303.1.8.1

Proponent: Stephen C. Shields, Arch Wood Protection, A Lonza Company, representing self (steve_shields@lonza.com)

Revise as follows:

2303.1.8.1 Identification. Wood required by Section 2304.11 to be preservative treated shall bear the quality *mark* of an inspection agency that maintains continuing supervision, testing and inspection over the quality of the *preservative-treated wood*. Inspection agencies for *preservative-treated wood* shall be *listed* by an accreditation body that complies with the requirements of the American Lumber Standards Treated Wood Program, or equivalent. The quality *mark* shall be on a stamp or *label* affixed to the *preservative-treated wood*, and shall include the following information:

1. Identification of treating manufacturer.
2. Type of preservative used.
~~3. Minimum preservative retention (pcf).~~
~~4~~<u>3.</u> End use for which the product is treated.
~~5~~<u>4.</u> AWPA standard to which the product was treated.
~~6~~<u>5.</u> Identity of the accredited inspection agency.

Reason: This change will simplify treated wood quality marking by removing information that is no longer of value.

With many different preservatives now in commercial use, retentions are no longer meaningful and have become confusing for consumers and building inspectors. The traditional 0.25 pounds per cubic foot (pcf) retention, which was at one time universally recognized for above ground treatment, is now only rarely found on commercially treated wood. For treated wood used in exposed, above ground applications (Use Category 3B) in the American Wood Protection Association Standards, various preservatives are listed with minimum retention requirements of 0.013, 0.019, 0.20, 0.04, 0.06, 0.07, 0.10, 0.15, 0.19, 0.206, 0.25, 0.40 and 8.0 pounds per cubic foot.

The existing (remaining) requirements for identification of the type of preservative, a description of the end use, the AWPA standard to which the product was treated and the identity of the approved inspection agency provide all of the information needed so that (1) inspection agency personnel can verify that the product has been manufactured to the retention and penetration required by the referenced standard and (2) a building inspector or consumer can verify that the product has been produced to the recognized standard under a recognized third party quality supervision program and that the product is being used in an application consistent with the end use description.

This change would not prohibit including the preservative retention on a label should a producer desire to do so, it would simply remove it from the listed of mandatory items required by the code. This would also allow producers to remove the retention reference as they redesign product labels from time to time in the normal course of business.

Cost Impact: The code change proposal will not increase the cost of construction.

S251-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2303.1.8.1-S-SHIELDS.doc

S252–12
202, 2303.2

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

2303.2 Fire-retardant-treated wood. *Fire-retardant-treated wood* shall be in accordance with Sections 2303.2.1 through 2303.2.9. ~~Fire-retardant-treated wood is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.~~

SECTION 202
DEFINITIONS

TREATED WOOD. Wood and wood-based materials that use vacuum-pressure impregnation processes to enhance fire retardant or preservative properties.

Fire-retardant-treated wood. Any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 10½ feet (3200 mm) beyond the centerline of the burners at any time during the test. ~~Pressure-treated lumber and plywood that exhibit reduced surface-burning characteristics and resist propagation of fire.~~

Preservative-treated wood. Pressure-treated wood products that exhibit reduced susceptibility to damage by fungi, insects or marine borers.

Reason: There are actually two definitions of Fire retardant treated wood. One in Section 202 and a more detail definition in the wood Section 2303.2, which states:

> "*Fire-retardant-treated* wood is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a *listed* flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burners at any time during the test."

At this time, they do not match. This will correct that issue and place the definition language from Section 2303.2 within Section 202 where it belongs.

Depending on the outcome of this proposal, a Group B proposal would be as follows:

Revise R802.1.3 as follows:

R802.1.3 Fire-retardant-treated wood. Fire-retardant treated wood (FRTW) shall be in accordance with Section R802.1.3.1 and R802.1.3.8. ~~is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and shows no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.~~

Revise R202as follows:

FIRE-RETARDANT-TREATED WOOD. Any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 pr UL723, a listed flame spread index of 25 or less and shows no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.~~Pressure-treated lumber and plywood that exhibit reduced surface-burning characteristics and resist propagation of fire.~~

~~**Other means during manufacturing.** A process where the wood raw material is treated with a fire-retardant formulation while undergoing creation as a finished product.~~

~~**Pressure process.** A process for treating wood using an initial vacuum followed by the introduction of pressure above atmosphere.~~

Cost Impact: This code change proposal will not increase the cost of construction since the provisions already exist in the code.

S252-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIRE RETARDANT TREATED WOOD-G-GODWIN.doc

S253–12
2303.2, Chapter 35 (NEW)

Proponent: Marcelo M. Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

2303.2 Fire-retardant-treated wood. *Fire-retardant-treated wood* is any homogeneous wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, ~~shall have, when tested in accordance with ASTM E 84 or UL 723, a *listed* flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test~~ complies with the requirements of ASTM E 2768 and is listed.

Add new standard to Chapter 35 as follows:

ASTM

E2768-2011 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)

Reason: ASTM has now issued a test method, ASTM E2768, which contains the three requirements discussed in section 2303.2, namely that a product be tested in accordance with ASTM E84 or UL 723, and exhibit a flame spread index of 25 or less, show no evidence of significant progressive combustion when the test is continued for 30 minutes (i.e. an additional 20-minute period over the standard ASTM E84 duration of 10 minutes) and that the flame front not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

Note that products listed as fire-retardant treated wood to UL 723 or to ASTM E84 (with the additional requirements shown above) will be able to continue to be listed to ASTM E2768 without having to be retested as the ASTM E2768 test method contains all of those requirements. Therefore, this code proposal is basically simple clarification.

The addition of the requirement that fire-retardant treated wood must be a “homogeneous” product is necessary to ensure that products that are coated or only partially impregnated with chemicals are not considered “fire-retardant treated wood” as they are not.

Note that there also needs to be consistency between the definition of fire-retardant treated wood and the requirements in this Chapter 23. At the last cycle it was established that it is important that the code not place a requirement regarding the means of manufacture and the definition at present in Chapter 2 discusses purely “pressure treated wood”. A separate proposal has been made to change the definition. The two changes can be made independently.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S253-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2303.2-S-HIRSCHLER.doc

S254–12
2303.4.3

Proponent: Larry Wainright, Qualtim, representing Structural Building Components Association (lwainright@qualtim.com)

Revise as follows:

2303.4.3 Truss submittal package. The truss submittal package provided by the truss manufacturer shall consist of each individual truss design drawing, the truss placement diagram, the permanent individual truss member restraint/bracing method and details and any other structural details germane to the trusses; and, as applicable, the cover/truss index sheet. The submittal package shall be submitted to the *registered design professional in responsible charge* for final approval prior to fabrication of trusses.

Reason: The purpose of this proposal is to help close the gap in communication that many times exists whereby the RDP does not get the truss submittal package for review to ensure the truss package meets the intent of the building design. The RDP should always have the opportunity to review these prior to fabrication. The language in this proposal is taken from the North Carolina Building Code where the issue of RDP approval has been thoroughly vetted.

Cost Impact: The code change proposal will not increase the cost of construction.

S254-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2303.4.3-S-WAINRIGHT.doc

S255–12
2304.6

Proponent: Jay Crandell, ARES Consulting, representing Foam Sheathing Committee (jcrandell@aresconsulting.biz)

Revise as follows:

2304.6 Wall sheathing. Where wall sheathing is used or required and except as provided for in Section 1405 for weatherboarding or where stucco construction that complies with Section 2510 is installed, enclosed buildings shall be sheathed with one of the materials of the nominal thickness specified in Table 2304.6, foam plastic insulation wall sheathing in accordance with Section 2603 or any other *approved* material ~~of equivalent strength or durability~~.

Reason: Foam plastic insulation wall sheathing is a commonly used sheathing material on wood frame walls and provides a means for energy code compliance and also, when approved, water resistive barrier compliance. Its inclusion in Section 2304.6 is necessary to ensure its appropriate use and provide guidance for enforcement by reference to requirements in Section 2603. In addition, Section 2304.6 as currently written requires that “wall sheathing” be used at the exclusion of other accepted wood construction practices that do not use wall sheathing. One example is post-frame buildings which often rely on metal panel diaphragms for weather resistance and bracing without use of wall sheathing. It is important to recognize that Section 2304 does not just apply to conventional wood frame construction using wall sheathing and should not exclusively require use of wall sheathing. Finally, the words “equivalent strength or durability” are stricken because the performance requirements for sheathing will depend on its purpose and application (e.g., all sheathing must have strength to resist wind load, but not all sheathing materials are used as bracing and should not be required to be equivalent on that attribute). Using the term “approved material” adequately conveys that appropriate attributes for sheathing must be provided on the basis of the intended application.

Cost Impact: The code change proposal will not increase the cost of construction.

S255-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.6-S-CRANDELL.doc

S256–12
Table 2304.6.1

Proponent: Edward L. Keith, P.E., APA – The Engineered Wood Association (ed.keith@apawood.org)

Revise as follows:

TABLE 2304.6.1
MAXIMUM NOMINAL DESIGN WIND SPEED, V_{asd} PERMITTED FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES [a,b,c]

b. The table is based on wind pressures acting toward and away from building surfaces in accordance with Section 30.7 of ASCE 7. Lateral requirements shall be in accordance with Section 2305 or Section 2308. <u>The table was developed based on the requirement that the specified wood structural panels would alone resist 100% of the applied wind load. Evaluation includes stud strength, nail withdrawal, nail head pull-through, and the sheathing deflection criteria of *l*/120 in accordance with Table 1604.3, where *l* = distance between studs.</u>

(Portions of table and footnotes not shown remain unchanged)

Reason: This code change is proposed to clarify the basis on which Table 2304.6.1 was developed and approved so as to provide guidance for any materials that are intended to establish equivalency to this table in accordance with Section 104.11 of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

S256-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.6.1-S-KEITH.doc

S257–12

2301.2, 2308.2.1, Table 2304.9.1, 2304.7.2.1(NEW), 2304.7.2.1.1 (NEW), Figure 2304.7.2.1.1 (NEW)

Proponent: T. Eric Stafford, representing Insurance Institute for Business and Home Safety

Revise as follows:

2301.2 General design requirements. The design of structural elements or systems, constructed partially or wholly of wood or wood-based products, shall be in accordance with one of the following methods:

1. *Allowable stress design* in accordance with Sections 2304, 2305 and 2306.
2. *Load and resistance factor design* in accordance with Sections 2304, 2305 and 2307.
3. *Conventional light-frame construction* in accordance with Sections 2304 and 2308.

   Exception: Buildings designed in accordance with the provisions of the AF&PA WFCM and Section 2304.7.2.1 shall be deemed to meet the requirements of the provisions of Section 2308.

4. The design and construction of log structures shall be in accordance with the provisions of ICC 400.

2308.2.1 Nominal design wind speed greater than 100 mph (3-second gust). Where V_{asd} as determined in accordance with Section 1609.3.1 exceeds 100 mph (3-second gust), the provisions of either AF&PA WFCM, or the ICC 600 are permitted to be used. Wind speeds in Figures 1609A, 1609B, and 1609C shall be converted in accordance with Section 1609.3.1 for use with AF&PA WFCM or ICC 600. Section 2304.7.2.1 shall apply to roof sheathing attachment when using the AF&PA WFCM or ICC 600.

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING[a,m]	LOCATION
31. Wood structural panels and particleboard[b] Subfloor, roof and wall sheathing (to framing) Where V_{ult} equals or exceeds 130 mph, wood structural panel roof sheathing shall be fastened in accordance with Section 2304.7.2.1 Single floor (combination subfloor-underlayment to framing)		

(Portions of Table not shown remain unchanged)

2304.7.2.1 Wood structural panel roof sheathing attachment. Where V_{ult} equals or exceeds 130 mph, wood structural panels used as roof sheathing shall be installed with joints staggered and fastened in accordance with Section 2304.7.2.1.1.

2304.7.2.1.1 Sheathing fastenings. Wood structural panel sheathing shall be fastened to roof framing with 8d annular ring-shank nails at 6 inches on center at edges and 6 inches on center at intermediate framing. Ring-shank nails shall have the following minimum dimensions:

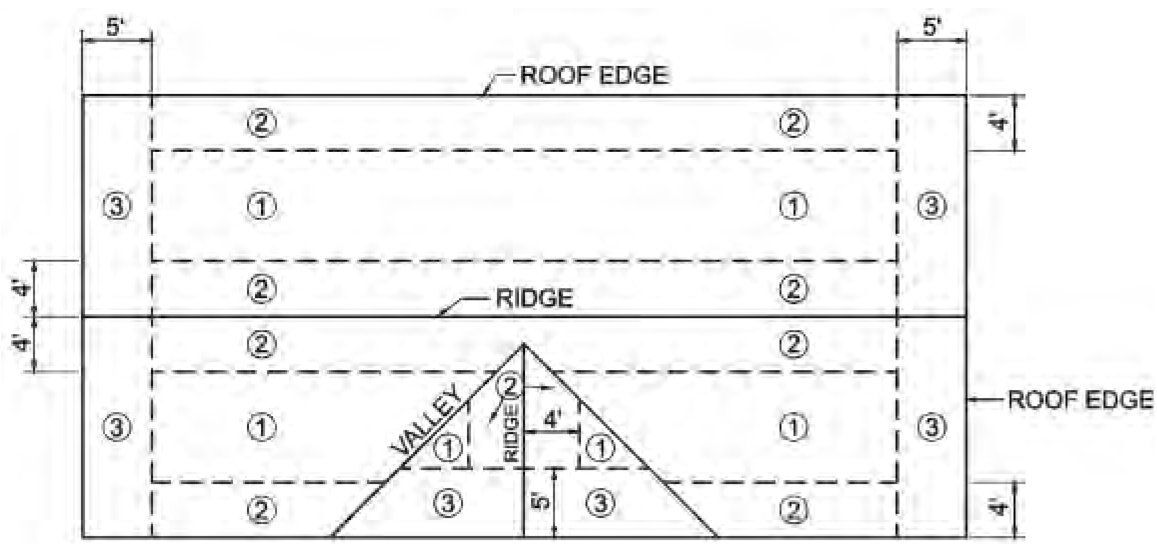
1. 0.113 inch nominal shank diameter
2. Ring diameter of 0.012 over shank diameter

3. <u>16 to 20 rings per inch</u>
4. <u>0.280 inch full round head diameter</u>
5. <u>2 inch nail length</u>

<u>Where roof framing with a specific gravity, 0.42 ≤ G < 0.49 is used, spacing of ring-shank fasteners shall be 4 inches on center in nailing zone 3 in accordance with Figure 2304.7.2.1.1 where V_{ult} is 130 mph or greater.</u>

<u>Exceptions:</u>

1. <u>Where roof framing with a specific gravity, 0.42 ≤ G < 0.49 is used, spacing of ring-shank fasteners shall be permitted at 12 inches on center at intermediate framing in nailing zone 1 for any V_{ult} and in nailing zone 2 for V_{ult} less than or equal to 140 mph in accordance with Figure 2304.7.2.1.1.</u>
2. <u>Where roof framing with a specific gravity, G ≥ 0.49 is used, spacing of ring-shank fasteners shall be permitted at 12 inches on center at intermediate framing in nailing zone 1 for any V_{ult} and in nailing zone 2 for V_{ult} less than or equal to 150 mph in accordance with Figure 2304.7.2.1.1.</u>
3. <u>Where roof framing with a specific gravity, G ≥ 0.49 is used, 8d common or 8d hot dipped galvanized box nails at 6 inches on center at edges and 6 inches on center at intermediate framing shall be permitted for V_{ult} less than or equal to 120 mph in accordance with Figure 2304.7.2.1.1.</u>
4. <u>Where roof diaphragm requirements necessitate a closer fastener spacing.</u>



<u>FIGURE 2304.7.2.1.1 ROOF SHEATHING NAILING ZONES</u>

Reason: This proposed modification, if approved, will significantly improve the performance of wood structural panel roofs when subjected to high wind loads. It does so at a minimal to negligible cost which provides an extremely generous benefit/cost ratio. The requirements are based on hundreds of true wood structural panel tests. Extensive roof sheathing fastening tests at Clemson University (Reinhold 2000 – 2002, McKinley 2001) and at the International Hurricane Center – Florida International University (Reinhold, Alvarez 2003) compared the Mean Failure Pressure in psf for roof sheathing panels using both the 8d common and the 8d ring shank nails spaced at 6 inches as prescribed by the code. Sheathing consisted of 5/8 inch thick plywood attached to nominal 2x4 Southern Yellow Pine rafters.

The results of these tests were as follows:

(1) Mean ultimate uplift capacity for panels attached with 8d common nails at 6 inch spacing: 126 pounds per square foot
(2) Mean ultimate uplift capacity for panels attached with 8d ring shank nails at 6 inch spacing: 292 pounds per square foot

This shows a 131% improvement in performance when 8d ring shank nails are used instead of the currently prescribed 8d common nails.

Requiring the use of 8d ring shank nails would result in an almost negligible increase in cost. While variations will occur regionally, it's estimated that the cost increase will be less than $10 for 2000 square foot roof.

Cost Impact: The code change proposal will increase the cost of construction.

S257-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2301.2-S-STAFFORD.doc

S258–12
2302.1, Table 2304.7(4)

Proponent: John Mulder, Intertek Testing Services, NA, Inc., representing International Standards Organization Technical Committee 77, *Products in Fibre-reinforced Cement,* and self

Revise as follows:

2302.1 Definitions. For the purposes of this chapter, and as used elsewhere in this code the following terms are defined in Chapter 2:

FIBER-CEMENT PRODUCTS

TABLE 2304.7(4)
ALLOWABLE SPAN FOR WOOD STRUCTURAL PANEL COMBINATION SUBFLOOR-UNDERLAYMENT (SINGLE FLOOR)[a, b]
(Panels Continuous Over Two or More Spans and Strength Axis Perpendicular to Supports)

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kN/m^2.

a. Spans limited to value shown because of possible effects of concentrated loads. Allowable uniform loads based on deflection of $^1/_{360}$ of span is 100 pounds per square foot except allowable total uniform load for 1$^1/_8$-inch wood structural panels over joists spaced 48 inches on center is 65 pounds per square foot. Panel edges shall have approved tongue-and-groove joints or shall be supported with blocking, unless $^1/_4$-inch minimum thickness wood panel-type or fiber-cement underlayment or 1$^1/_2$ inches of approved cellular or lightweight concrete is placed over the subfloor, or finish floor is $^3/_4$-inch wood strip.

(Portions of table not shown remain unchanged)

Reason: A revision to Table 2304.7(4) is proposed to include “fiber-cement underlayment”. The term “fiber-cement products” is proposed to be included in the definitions here consistent with the definition published in the Terminology Standard ASTM C1154-06, *Standard Terminology for Non-Asbestos Fiber-Reinforced Cement Products* (see attached Standard) and also proposed for revision in Chapter 2 of the IBC code. The current footnote does not clearly describe the allowable type of permitted underlayment. The inclusion of references to ”wood panel-type” and “fiber-cement” clarifies the types of recognized products permitted in this type of Code-compliant subfloor/underlayment application (see attached ICC-ES ESR-1381[reference Section 4.3], ESR-2280[reference Sections 4.2.2.1 and 4.2.3.1], and ESR-2292[reference Section 4.2]). “See the ICC-ES website (http://www.icc-es.org/) to gain access to the referenced ESR reports. “

Cost Impact: The code change proposal will not increase the cost of construction because the proposed addition of fiber-cement underlayment to the table footnote only provides for the choice and use of a type of underlayment currently used in this type of application and permitted in Evaluation Service Reports.

S258-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2302.1-T2304.7(4)-S-MULDER.doc

S259–12

2304.9.1, Table 2304.9.1

Proponent: Erin Ashley, URS Corporation, representing Department of Homeland Security, Federal Emergency Management Agency (erin.ashley@urscom), John Ingargiola, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@fema.dhs.gov)

Revise as follows:

2304.9.1 Fastener requirements. Connections for wood members shall be designed in accordance with the appropriate methodology in Section 2301.2. For conventional light frame construction in accordance with Section 2308, connections for wood members are permitted to be in accordance with Table 2304.9.1. The number and size of fasteners connecting wood members shall not be less than that set forth in Table 2304.9.1 for any method of wood construction.

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING[a,m,g]	LOCATION

g. This table is subject to the limitations stated in Section 2308.2

(Portions of table and footnotes not shown remain unchanged)

Reason: The proposed addition of the footnote identifies the limitations of Table 2304.9.1 **Fastening Schedule,** which are set forth several sections later in the code as a condition of the table addressing *conventional light-frame construction*. Limitations to *conventional light-frame construction* are located in Section 2308.2, but these limitations are not directly referred to in Section 2304.9 **Connectors and fasteners** and not currently referenced for the entire Table 2304.9.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S259-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.9.1-S-ASHLEY-INGARGIOLA.doc

S260–12
2304.9.6

Proponent: Jay Crandell, ARES Consulting, representing Foam Sheathing Committee (jcrandell@aresconsulting.biz)

Revise as follows:

2304.9.6 Load path. Where wall framing members are not continuous from foundation sill to roof, the members shall be secured to ensure a continuous load path. Where required, sheet metal clamps, ties or clips shall be formed of galvanized steel <u>not less than 0.0179 inch (0.45 mm) minimum thickness</u> or other *approved* corrosion-resistant material ~~not less than 0.040 inch (1.01 mm) nominal thickness~~ <u>capable of resisting the applied loads</u>.

Reason: The code needs to allow thinner steel based on performance to, when possible, avoid interference of uplift straps with fastening/installation of interior and exterior finishes and sheathings. AISI Standard S105 Product Data permits minimum steel thickness of 0.0179 inches thick for structural and non-structural applications. In addition, 24CFR Section 3280.305 also permits uplift straps of minimum 26 gage (0.0179 inch thick) for manufactured homes even in the highest of wind zones. The current minimum 0.040 inch thickness requirement is not consistent with existing industry consensus standards and needs to be changed such that minimum required steel thickness is governed by performance needed for a specific application.

Cost Impact: The code change proposal will not increase the cost of construction.

S260-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.9.6-S-CRANDELL.doc

S261–12
Table 2304.9.1

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa-se.com)

Revise as follows:

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING[a,m]	LOCATION
12. Rim joist to top plate, or other framing below	8d (21/2" × 0.131") at 6" o.c. 3" × 0.131" nail at 6" o.c. 3" 14 gage staple at 6" o.c.	toenail

(Portions of table not shown remain unchanged)

Reason: The current code language does not explicitly require connections at perimeter joists to a foundation sill ("mudsill") in the case where a framed floor is built over a crawlspace without cripple-walls (the foundation walls extend to the underside of the floor framing).

This item was first introduced in the 1994 UBC to provide a more complete lateral load path to resist earthquake or wind forces. The original intent surely was to provide for lateral strength in all buildings constructed over a raised foundation: not just cases where cripple walls are present, and not to exclude connections along the sides of the building where framing is parallel to the foundation or cripple wall below.

Lack of connection along joists to the parallel supporting members is considered a deficiency under the 2009 IEBC (for buildings with more than one floor above). IEBC Section A304.1.4 requires supplementation of the joist-to-mudsill or joist-to-top plate connection if existing connectors are not present at 6" on center. The current IBC language for this connection requirement allows construction that is immediately in need of strengthening under the IEBC.

Cost Impact: Negligible cost for new construction; Substantial savings in possible retrofit costs in the case where the deficient connection would have to be supplemented to meet IEBC requirements; Immense savings over losing a building in an earthquake due to an incomplete load path.

S261-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1#1-S-KERR.doc

S262–12
Table 2304.9.1

Proponent: Thor Matteson, S.E., representing self

Revise as follows:

TABLE 2304.9.1
FASTENING SCHEDULE

Connection	**Fastening**	**Location**
11. Blocking between joists or rafters to foundation sill, girder, beam, top plate, or other framing below	3 - 8d common ($2^1/_2$″ × 0.131″) 3 - 3″ × 0.131″ nails 3 - 3″14 gage staples	Toe-nail

(Portions of table not shown remain unchanged)

Reason: The current code language does not explicitly require connections at blocking to a foundation sill ("mudsill") in the case where a framed floor is built over a crawlspace without cripple-walls (the foundation walls extend to the underside of the floor framing).

This item was first introduced in the 1994 UBC to provide a more complete lateral load path to resist earthquake or wind forces. The original intent surely was to provide for lateral strength in all buildings constructed over a raised foundation, not just cases where cripple walls are present.

Lack of connection to the mudsill is considered a deficiency under the 2009 IEBC (for buildings with more than one floor above). IEBC Section A304.1.3 requires supplementation of the blocking-to-mudsill connection if existing connectors are not present at 6" on center. The current IBC language for this connection requirement allows construction that is immediately in need of strengthening under the IEBC.

Cost Impact: Negligible cost for new construction; Substantial savings in possible retrofit costs in the case where the deficient connection would have to be supplemented to meet IEBC requirements; Immense savings over losing a building in an earthquake due to an incomplete load path.

S262-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1 #1-S-MATTESON

S263–12
Table 2304.9.1

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates, representing Structural Engineers Association of California (SEAOC) (skerr@jwa.se.com)

Revise as follows:

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING^{a,m}	LOCATION
11. Blocking between joists or rafters to top plate, or other framing below	3 - 8d common (21/2" × 0.131") 3 - 3" × 0.131" nails 3 - 3" 14 gage staples	toenail

(Portions of table not shown remain unchanged)

Reason: The current code language does not explicitly require connections at blocking to a foundation sill ("mudsill") in the case where a framed floor is built over a crawlspace without cripple-walls (the foundation walls extend to the underside of the floor framing).

This item was first introduced in the 1994 UBC to provide a more complete lateral load path to resist earthquake or wind forces. The original intent surely was to provide for lateral strength in all buildings constructed over a raised foundation, not just cases where cripple walls are present.

Lack of connection to the mudsill is considered a deficiency under the 2009 IEBC (for buildings with more than one floor above). IEBC Section A304.1.3 requires supplementation of the blocking-to-mudsill connection if existing connectors are not present at 6" on center. The current IBC language for this connection requirement allows construction that is immediately in need of strengthening under the IEBC.

Cost Impact: Negligible cost for new construction; Substantial savings in possible retrofit costs in the case where the deficient connection would have to be supplemented to meet IEBC requirements; Immense savings over losing a building in an earthquake due to an incomplete load path.

S263-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1#2-S-KERR.doc

S264–12
Table 2304.9.1

Proponent: Thor Matteson, Structural Engineer, representing self (thor2304@shearwalls.com)

Revise as follows:

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING[a,m]	LOCATION
12. ~~Rim~~ Perimeter joist (end-joist, or band, rim, or header joist) to foundation sill, girder, beam, top plate, or other framing below	8d ($2^{1}/_{2}$″ × 0.131″) at 6″ o.c. 3″ × 0.131″ nail at 6″ o.c. 3″14 gage staple at 6″ o.c.	Toenail

(Portions of table not shown remain unchanged.)

Reason: The current code language does not explicitly require connections at perimeter joists to a foundation sill ("mudsill") in the case where a framed floor is built over a crawlspace without cripple-walls (the foundation walls extend to the underside of the floor framing). The current code also does not define "Rim joist". Carpenters in different regions use different terms for various framing members. In some areas the term "Rim joist" may mean any perimeter floor framing member; in other areas it may exclude perimeter joists that run parallel to footings or walls below (such members are commonly called "End joists").

This item was first introduced in the 1994 UBC to provide a more complete lateral load path to resist earthquake or wind forces. The original intent surely was to provide for lateral strength in all buildings constructed over a raised foundation: not just cases where cripple walls are present, and not to exclude connections along the sides of the building where framing is parallel to the foundation or cripple wall below.

Lack of connection along joists to the parallel supporting members is considered a deficiency under the 2009 IEBC (for buildings with more than one floor above). IEBC Section A304.1.4 requires supplementation of the joist-to-mudsill or joist-to-top plate connection if existing connectors are not present at 6" on center. The current IBC language for this connection requirement allows construction that is immediately in need of strengthening under the IEBC.

This change would also make the Code more usable (internationally especially) where terminology varies for different framing components.

Cost Impact: Negligible cost for new construction; Substantial savings in possible retrofit costs in the case where the deficient connection would have to be supplemented to meet IEBC requirements; Immense savings over losing a building in an earthquake due to an incomplete load path.

S264-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1-S-MATTESON #2

S265–12
Table 2304.9.1

Proponent: Charles S. Bajnai, Chesterfield County, VA, representing ICC Building Code Action Committee (bajnaic@chesterfield.gov)

Delete and substitute as follows:

~~**TABLE 2304.9.1**~~
~~**FASTENING SCHEDULE**~~

Table 2304.9.1
FASTENING SCHEDULE

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
	ROOF		
1	Blocking between ceiling joists or rafters to top plate	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	at each end, toenail
2	Ceiling joists to top plate	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	per joist, toenail
3	Ceiling joist not attached to parallel rafter, laps over partitions (no thrust) (see Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (3.5" x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Face nail
4	Ceiling joist attached to parallel rafter (heel joint) (see Section 2308.10.4.1, Table 2308.10.4.1)	Per table 2308.10.4.1	Face nail
5	Collar tie to rafter	3-10d common (3" x 0.148"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Face nail
6	Rafter or roof truss to top plate (See Section 2308.10.1, Table 2308.10.1)	3-10 common (3" x 0.148"); or 3-16d box (3.5" x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131 nails; or 4-3" 14 gage staples, 7/16" crown	Toenail[c]
7	Roof rafters to ridge valley or hip rafters; or, roof rafter to 2-inch ridge beam	2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown; or	End nail
		3-10d common (3.5" x 0.148"); or 3-16d box (3.5" x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Toenail
	WALL		
8	Stud to stud (not at braced wall panels)	16d common (3.5" x 0.162");	24" o.c. face nail
		10d box (3" x 0.128"); or	16" o.c. face nail

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
		3” x 0.131” nails; or 3-3” 14 gage staples, 7/16” crown	
9	Stud to stud and abutting studs at intersecting wall corners (at braced wall panels)	16d common (3.5” x 0.162”); or	16” o.c. face nail
		16d box (3.5” x 0.135”); or	12” o.c. face nail
		3” x 0.131” nails; or 3-3” 14 gage staples, 7/16” crown	12” o.c. face nail
10	Built-up header (2-inch to 2-inch header)	16d common (3.5" x 0.162"); or	16” o.c. each edge, face nail
		16d box (3.5” x 0.135”)	12” o.c. each edge, face nail
11	Continuous header to stud	4-8d common (2.5" x 0.131"); or 4-10d box (3" x 0.128")	Toenail
12	Top plate to top plate	16d common (3.5" x 0.162"); or	16” o.c. face nail
		10d box (3" x 0.128"); or 3” x 0.131” nails; or 3” 14 gage staples, 7/16” crown	12” o.c. face nail
13	Top plate to top plate, at end joints	8-16d common (3.5" x 0.162"); or 12-10d box (3" x 0.128"); or 12-3” x 0.131” nails; or 12-3” 14 gage staples, 7/16” crown	Face nail on each side of end joint (minimum 24” lap splice length each side of end joint)
14	Bottom plate to joist, rim joist, band joist or blocking (not at braced wall panels)	16d common (3.5" x 0.162"); or	16” o.c. face nail
		16d box (3.5" x 0.135"); or 3” x 0.131” nails; or 3” 14 gage staples, 7/16” crown	12” o.c. face nail
15	Bottom plate to joist, rim joist, band joist or blocking at braced wall panels	2-16d common (3.5" x 0.162"); or 3-16d box (3.5" x 0.135"); or 4-3” x 0.131” nails; or 4-3” 14 gage staples, 7/16” crown	16” o.c. face nail
16	Stud to bottom plate	4-8d common (2.5" x 0.131"); or 4-10d box (3" x 0.128"); or 4-3” x 0.131” nails; or 4-3” 14 gage staples, 7/16” crown; or	Toenail
		2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3” x 0.131” nails; or 3-3” 14 gage staples, 7/16” crown	End nail
17	Top or bottom plate to stud	2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3” x 0.131” nails; or 3-3” 14 gage staples, 7/16” crown	End nail
18	Top plates, laps at corners and intersections	2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16” crown	Face nail
19	1” brace to each stud and plate	2-8d common (2.5" x 0.131"); or 2-10d box (3" x 0.128"); or 2-3" x 0.131" nails; or 2-3" 14 gage staples, 7/16” crown	Face nail
20	1” x 6” sheathing to each bearing	2-8d common (2.5" x 0.131"); or 2-10d box (3" x 0.128")	Face nail

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION	
21	1” x 8” and wider sheathing to each bearing	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128")	Face nail	
	FLOOR			
22	Joist to sill, top plate, or girder	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16” crown	Toenail	
23	Rim joist, band joist, or blocking to sill or top plate	8d common (2.5" x 0.131"); or 10d box (3" x 0.128"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16” crown	6” o.c., toenail	
24	1” x 6” subfloor or less to each joist	2-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128")	Face nail	
25	2” subfloor to joist or girder	2-16d common (3.5" x 0.162")	Face nail	
26	2” planks (plank & beam – floor & roof)	2-16d common (3.5" x 0.162")	At each bearing, face nail	
27	Built-up girders and beams, 2-inch lumber layers	20d common (4” x 0.192”)	32” o.c., face nail at top and bottom staggered on opposite sides	
		10d box (3" x 0.128"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16” crown	24” o.c. face nail at top and bottom staggered on opposite sides	
		And: 2-20d common (4” x 0.192”); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16” crown	Face nail at ends and at each splice	
28	Ledger strip supporting joists or rafters	3-16d common (3.5" x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16” crown	At each joist or rafter, face nail	
29	Joist to band joist or rim joist	3-16d common (3.5" x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16” crown	End nail	
30	Bridging to joist	2-8d common (2.5" x 0.131"); or 2-10d box (3" x 0.128"); or 2-3" x 0.131" nails; or 2-3" 14 gage staples, 7/16” crown	Each end, toenail	
	Wood structural panels (WSP), subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing[a]			
			Edges (inches)	Intermediate supports (inches)
31	3/8” – 1/2"	6d common or deformed (2” x 0.113”) (subfloor and wall)	6	12
		8d box or deformed (2.5" x 0.113") (roof)	6	12
		2 3/8” x 0.113” nail (subfloor and wall)	6	12
		1 ¾” 16 gage staple, 7/16” crown	4	8

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION	
		(subfloor and wall)		
		2 3/8 x 0.113" nail (roof)	4	8
		1 ¾" 16 gage staple, 7/16" crown (roof)	3	6
32	19/32" – 3/4"	8d common (2.5" x 0.131"); or 6d deformed (2" x 0.113)	6	12
		2 3/8" x 0.113" nail; or 2" 16 gage staple, 7/16" crown	4	8
33	7/8" – 1 1/4"	10d common (3" x 0.148"); or 8d deformed (2.5" x 0.131")	6	12
	Other exterior wall sheathing			
34	1/2" fiberboard sheathing[b]	1 ½" galvanized roofing nail (7/16" head diameter; or 6d common (2" x 0.113"); or 1 ¼" 16 gage staple with 7/16" or 1" crown	3	6
35	25/32" fiberboard sheathing[b]	1 ¾" galvanized roofing nail (7/16" diameter head); or 8d common (2.5" x 0.131"); or 1 ½" 16 gage staple with 7/16" or 1" crown	3	6
	Wood structural panels, combination subfloor underlayment to framing			
36	3/4" and less	8d common (2.5" x 0.131"); or6d deformed (2" x 0.113")	6	12
37	7/8" – 1"	8d common (2.5" x 0.131"); or 8d deformed (2 ½" x 0.131")	6	12
38	1 1/8" – 1 ¼"	10d common (3" x 0.148"); or 8d deformed (2 ½" x 0.131")	6	12
	Panel Siding to Framing			
39	½" or less	6d corrosion-resistant siding (1 7/8" × 0.106"); or 6d corrosion-resistant casing (2" × 0.099")	6	12
40	5/8"	8d corrosion-resistant siding (2 3/8" × 0.128"); or 8d corrosion-resistant casing (2 1/2" × 0.113")	6	12
	Interior Paneling			
41	¼"	4d casing (11/2" × 0.080"); or 4d finish (11/2" × 0.072")	6	12
42	3/8"	6d casing (2" × 0.099"); or 6d finish (Panel supports at 24 inches)	6	12

a. Nails spaced at 6 inches at intermediate supports where spans are 48 inches or more. For nailing of wood structural panel and particleboard diaphragms and shear walls, refer to Section 2305. Nails for wall sheathing are permitted to be common, box, or casing.

b. Spacing shall be 6 inches on center on the edges and 12 inches on center at intermediate supports for nonstructural applications. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked).

c. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule and the ceiling joist is fastened to the top plate in accordance with this schedule, the number of toenails in the rafter shall be permitted to be reduced by one nail.

Reason: The ICC Building Code Action Committee sought to reformat and correlate the current fastening schedule for wood frame construction in Chapter 23 with the current fastening schedule in the IRC. The organization of the IRC table was thought to be easier to use, and it was generally acknowledged that it may help users of both codes if the tables more closely resembled each other in format and content.

Descriptions of specified fastening and their capacities in the IBC and IRC tables were compared. In developing the proposed new table, the committee tried to make as few technical changes as possible while reorganizing and reformatting the IBC table to look more like the IRC table. Care was taken to retain, for the most part, all fastening alternatives currently in the IBC, while at the same time adding appropriate alternatives that appear in the IRC for the same connection, if they were missing.

To attain complete coordination between the two tables was not possible because certain technical changes that would have been required were beyond the chosen scope of the committee's work. However, the proposed table is much closer to the IRC table and the committee will look at the IRC table in the Group B changes to attempt further correlations between the two.

When inconsistencies or apparent anomalies were discovered between tables or within the IBC table itself, in general the following principles were applied:

a. attempt to establish a reference common nail specification for each connection where it appeared to be lacking;
b. provide box nails alternatives, if lacking, where possible
c. retain all current alternatives for power-driven and staple alternatives (though in a few cases the number or size of fastener was adjusted to be consistent with the IRC or to achieve consistency within the IBC table itself based on other entries);
d. in creating box nail alternatives where they currently are missing, for simplicity assume 10d box nails (3" x 0.128") to be equivalent to 3" x 0.131" power-driven fasteners;
e. take into account calculated connection capacities. (These were also compared to the engineered connections specified in the AWC Wood Frame Construction Manual for like connections.)

Finally, this proposed IBC table is much cleaner and more complete than the current table. Besides adding many fastener alternatives, many detailed and difficult-to-use footnotes in the current table were eliminated since their content was incorporated directly into the proposed table.

The following three tables are provided: i) the proposed IBC Table 2304.9.1 with an additional column of notes explaining how it correlates to the existing IBC table, ii) the existing IBC Table 2304.9.1 with an additional column of notes explaining how it correlates to the proposed IBC table, and iii) the existing IRC table, shown for reference.

Proposed Table 2304.9.1 with additional column of explanation:

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION	*Notes:*
		ROOF		
1	Blocking between ceiling joists or rafters to top plate	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	at each end, toenail	*-Nailing from IBC Row 11. -10d box equivalent to 8d common added.*
2	Ceiling joists to top plate	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	per joist, toenail	*-Nailing from IBC Row 15. -10d box equivalent to 8d common added. -Correct power driven number from 5 to 3.*
3	Ceiling joist not attached to parallel rafter, laps over partitions (no thrust) (for parallel rafter case see Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (3.5" x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Face nail	*-Nailing from IBC Row 17. -10d box equivalent to power driven nail size added.*
4	Ceiling joist attached to parallel rafter (heel joint) (see Section 2308.10.4.1, Table 2308.10.4.1)	Per table 2308.10.4.1	Face nail	*-Nailing from IBC Row 18.*
5	Collar tie to rafter	3-10d common (3" x 0.148"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Face nail	*-Nailing from IBC Row 26. -10d box equivalent to power driven nail size added.*
6	Rafter or roof truss to top plate (See Section 2308.10.1, Table 2308.10.1)	3-10 common (3" x 0.148"); or 3-16d box (3.5" x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131 nails; or 4-3" 14 gage staples, 7/16" crown	Toenail[c]	*-Nailing from IRC Row 5. -10d box equivalent to power driven nail size added.*

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION	*Notes:*
7	Roof rafters to ridge valley or hip rafters; or, roof rafter to 2-inch ridge beam	2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown; or	End nail	*-Nailing from IBC Rows 27 and 28.* *-10d box equivalent to power driven nail size added.*
		3-10d common (3.5" x 0.148"); or 3-16d box (3.5" x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Toenail	*-Nailing from IBC Rows 27 and 28.* *-10d box equivalent to power driven nail size added.* *-16d box per IRC for toenailing of rafter in Row 6 added.*
		WALL		
8	Stud to stud (not at braced wall panels)	16d common (3.5" x 0.162");	24" o.c. face nail	*-Nailing from IBC Row 9.*
		10d box (3" x 0.128"); or 3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	16" o.c. face nail	*-10d box equivalent to power driven nail size added.* *-Corrected spacing for power driven nail to be equivalent to the specified common nail.*
9	Stud to stud and abutting studs at intersecting wall corners (at braced wall panels)	16d common (3.5" x 0.162"); or	16" o.c. face nail	*-Nailing from IBC Row 23.* *-16d box equivalent from IRC Row 8.*
		16d box (3.5" x 0.135"); or 3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	12" o.c. face nail	
10	Built-up header (2-inch to 2-inch header)	16d common (3.5" x 0.162"); or	16" o.c. each edge, face nail	*-Nailing from IBC Row 14.* *-16d box equivalent added but at 12" o.c. spacing.*
		16d box (3.5" x 0.135")	12" o.c. each edge, face nail	
11	Continuous header to stud	4-8d common (2.5" x 0.131"); or 4-10d box (3" x 0.128")	Toenail	*-Nailing from IBC Row 16.* *-10d box equivalent to 8d common added.*
12	Top plate to top plate	16d common (3.5" x 0.162"); or	16" o.c. face nail	*-Nailing from IBC Row 10 except that 16d common specified in lieu of 16d box to align with power driven sizes.* *-10d box equivalent to power driven sizes added.*
		10d box (3" x 0.128"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16" crown	12" o.c. face nail	
13	Top plate to top plate, at end joints	8-16d common (3.5" x 0.162"); or 12-10d box (3" x 0.128"); or 12-3" x 0.131" nails; or 12-3" 14 gage staples, 7/16" crown	Face nail on each side of end joint (minimum 24" lap splice length each side of end joint)	*-Nailing from IBC Row 10.* *-10d box equivalent to power driven sizes added.*
14	Bottom plate to joist, rim joist, band joist or blocking (not at braced wall panels)	16d common (3.5" x 0.162"); or	16" o.c. face nail	*-Nailing from IBC Row 6 except that 16d common used in lieu of 16d box.* *-16d box equivalent added at 12" o.c.*

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION	*Notes:*
		16d box (3.5" x 0.135"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16" crown	12" o.c. face nail	
15	Bottom plate to joist, rim joist, band joist or blocking at braced wall panels	2-16d common (3.5" x 0.162"); or 3-16d box (3.5" x 0.135"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	16" o.c. face nail	*-Nailing from IBC Row 6; 16d common equivalent added*
16	Stud to bottom plate	4-8d common (2.5" x 0.131"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown; or	Toenail	*-Nailing per IBC Row 8.* *-10d box equivalent to 8d common added.*
		2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	End nail	*-Nailing per IBC Row 8.* *-10d box equivalent to power driven sizes added.*
17	Top or bottom plate to stud	2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	End nail	*-Nailing per IBC Row 7.* *-10d box equivalent to power driven sizes added.*
18	Top plates, laps at corners and intersections	2-16d common (3.5" x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Face nail	*-Nailing per IBC Row 13.* *-10d box equivalent to power driven sizes added.*
19	1" brace to each stud and plate	2-8d common (2.5" x 0.131"); or 2-10d box (3" x 0.128"); or 2-3" x 0.131" nails; or 2-3" 14 gage staples, 7/16" crown	Face nail	*-Nailing per IBC Row 20.* *-10d box equivalent to 8d common added.*
20	1" x 6" sheathing to each bearing	2-8d common (2.5" x 0.131"); or 2-10d box (3" x 0.128")	Face nail	*-Nailing per IRC Row 21 .* *-10d box equivalent to 8d common added.*
21	1" x 8" and wider sheathing to each bearing	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128")	Face nail	*-Nailing per IRC Rows 22 and 23, and IBC Rows 4, 21 and 22.* *-10d box equivalent to 8d common added.*
		FLOOR		
22	Joist to sill, top plate, or girder	3-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Toenail	*-Nailing from IBC Row 1.* *-10d box equivalent to 8d common added.*
23	Rim joist, band joist, or blocking to sill or top plate	8d common (2.5" x 0.131"); or 10d box (3" x 0.128"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16" crown	6" o.c., toenail	*-Nailing from IBC Row 12.* *-10d box equivalent to 8d common added.*
24	1" x 6" subfloor or less to each joist	2-8d common (2.5" x 0.131"); or 3-10d box (3" x 0.128")	Face nail	*-Nailing from IBC Row 3.* *-10d box equivalent to 8d common added*
25	2" subfloor to joist or girder	2-16d common (3.5" x 0.162")	Face nail	*-Nailing from IBC Row 5.*

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION		*Notes:*
26	2" planks (plank & beam – floor & roof)	2-16d common (3.5" x 0.162")	At each bearing, face nail		*-Nailing from IBC Row 25.*
27	Built-up girders and beams, 2-inch lumber layers	20d common (4" x 0.192")	32" o.c., face nail at top and bottom staggered on opposite sides		*-Nailing from IBC Row 24. -10d box equivalent to power driven nail size added.*
		10d box (3" x 0.128"); or 3" x 0.131" nails; or 3" 14 gage staples, 7/16" crown	24" o.c. face nail at top and bottom staggered on opposite sides		
		And: 2-20d common (4" x 0.192"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Face nail at ends and at each splice		*-Nailing from IBC Row 24. -10d box equivalent to power driven nail sizes added.*
28	Ledger strip supporting joists or rafters	3-16d common (3.5" x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	At each joist or rafter, face nail		*-Nailing from IBC Row 30. -10d box equivalent to power driven nail size added.*
29	Joist to band joist or rim joist	3-16d common (3.5" x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	End nail		*-Nailing from IBC Row 29. -10d box equivalent to power driven nail size added.*
30	Bridging to joist	2-8d common (2.5" x 0.131"); or 2-10d box (3" x 0.128"); or 2-3" x 0.131" nails; or 2-3" 14 gage staples, 7/16" crown	Each end, toenail		*-Nailing from IBC Row 2. -10d box equivalent to 8d common nail added.*
	Wood structural panels (WSP), subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing[a]				
			Edges (inches)	Intermediate supports (inches)	
31	3/8" – 1/2"	6d common or deformed (2" x 0.113") (subfloor and wall)	6	12	*-Nailing from IBC Row 31.*
		8d box or deformed (2.5" x 0.113") (roof)	6	12	*-Nailing from IBC Row 31 footnote "L".*
		2 3/8" x 0.113" nail (subfloor and wall)	6	12	*-Nailing from IBC Row 31.*
		1 ¾" 16 gage staple, 7/16" crown (subfloor and wall)	4	8	*-Nailing from IBC Row 31 and footnote "o".*
		2 3/8 x 0.113" nail (roof)	4	8	*-Nailing from IBC Row 31 and footnote "n".*
		1 ¾" 16 gage staple, 7/16" crown (roof)	3	6	*-Nailing from IBC Row 31 and footnote "o".*
32	19/32" – 3/4"	8d common (2.5" x 0.131"); or 6d deformed (2" x 0.113)	6	12	*-Nailing from IBC Row 31.*
		2 3/8" x 0.113" nail; or 2" 16 gage staple, 7/16" crown	4	8	*-Nailing from IBC Row 31 and footnote "p".*
33	7/8" – 1 1/4"	10d common (3" x 0.148"); or 8d deformed (2.5" x 0.131")	6	12	*-Nailing from IBC Row 31 and footnote "e".*
	Other exterior wall sheathing				
34	1/2" fiberboard sheathing[b]	1 ½" galvanized roofing nail (7/16" head diameter; or 6d common (2" x 0.113"); or 1 ¼" 16 gage staple with 7/16" or 1" crown	3	6	*-Nailing from IBC Row 33 and footnote "g" and "h" and "i".*
35	25/32" fiberboard sheathing[b]	1 ¾" galvanized roofing nail (7/16" diameter head); or 8d common (2.5" x 0.131"); or 1 ½" 16 gage staple with 7/16"	3	6	*-Nailing from IBC Row 33 and footnote "g" and "h" and "i".*

	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION		*Notes:*
		or 1” crown			
	Wood structural panels, combination subfloor underlayment to framing				
36	3/4” and less	8d common (2.5" x 0.131"); or6d deformed (2” x 0.113”)	6	12	*-Nailing from IBC Row 31 and footnote “e” and IRC Row 39 for common nail size.*
37	7/8” – 1”	8d common (2.5" x 0.131"); or 8d deformed (2 ½” x 0.131”)	6	12	*-Nailing from IBC Row 31 and footnote “e” and IRC Row 40 for common nail size.*
38	1 1/8” – 1 ¼”	10d common (3" x 0.148"); or 8d deformed (2 ½” x 0.131”)	6	12	*-Nailing from IBC Row 31 for common and deformed nail size.*
	Panel Siding to Framing				
39	½” or less	6d corrosion-resistant siding (1 7/8" × 0.106"); or 6d corrosion-resistant casing (2" × 0.099")	6	12	*-Nailing from IBC Row 32 and footnote “f”.*
40	5/8”	8d corrosion-resistant siding (2 3/8" × 0.128"); or 8d corrosion-resistant casing (2 1/2" × 0.113")	6	12	*-Nailing from IBC Row 32 and footnote “f”.*
	Interior Paneling				
41	¼”	4d casing (11/2" × 0.080"); or 4d finish (11/2" × 0.072")	6	12	*-Nailing from IBC Row 34 and footnote “j”.*
42	3/8”	6d casing (2" × 0.099"); or 6d finish (Panel supports at 24 inches)	6	12	*-Nailing from IBC Row 34 and footnote “k”.*

a. Nails spaced at 6 inches at intermediate supports where spans are 48 inches or more. For nailing of wood structural panel and particleboard diaphragms and shear walls, refer to Section 2305. Nails for wall sheathing are permitted to be common, box or casing.

b. Spacing shall be 6 inches on center on the edges and 12 inches on center at intermediate supports for nonstructural applications. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked).

c. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule and the ceiling joist is fastened to the top plate in accordance with this schedule, the number of toenails in the rafter shall be permitted to be reduced by one nail.

Current (Existing) Table 2304.9.1 with additional column indicating new location:

CONNECTION	FASTENING[a, m]	LOCATION	*Notes:*
1. Joist to sill or girder	3-8d common (2 ½ “ x 0.131”) 3-3” x 0.131” nails 3-3” 14 gage staples	toenail	*to new row 22*
2. Bridging to joist	2-8d common (2 ½” x 0.131”) 2-3” x 0.131” nails 2-3” 14 gage staples	toenail each end	*to new row 30*
3. 1” x 6” subfloor or less to each joist	2-8d common (2 ½” x 0.131”)	face nail	*to new row 24*
4. Wider than 1” x 6” subfloor to each joist	3-8d common (2 ½” x 0.131”)	face nail	*deleted from table, wider condition addressed by row 21*
5. 2” subfloor to joist or girder	2-16d common (3 ½” x 0.162”)	Blind and face nail	*to new row 25*
6. sole plate to joist or blocking Sole plate to joist or blocking at braced wall panel	16d (3 ½” x 0.135”) at 16” o.c. 3” x 0.131” nails at 8 o.c. 3” 14 gage staples at 12” o.c. 3-16d (3 ½” x 0.135”) at 16” o.c. 4-3” x 0.131” nails at 16” o.c. 4-3” 14 gage staples at 16” o.c.	typical face nail braced wall panels	*to new row 14* *to new row 15*
7. Top plate to stud	2-16d common (3 ½” x 0.162”) 3-3” x 0.131” nails 3-3” 14 gage staples	end nail	*to new row 17*
8. Stud to sole plate	4-8d common (2 ½” x 0.131”) 4-3” x 0.131” nails 3-3” 14 gage staples	toenail	*to new row 16 and 17*

CONNECTION	FASTENING[a, m]	LOCATION	***Notes:***
	2-16d common (3 ½" x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	end nail	*to new row 16 and 17*
9. Double studs	16d (3 ½" x 0.135") at 24" o.c. 3" x 0.131" nail at 8" o.c. 3" 14 gage staple at 8" o.c.	face nail	*to new rows 8 and 9*
10. Double top plates Double top plates	16d (3 ½" x 0.135") at 16" o.c. 3" x 0.131" nail at 12" o.c. 3" 14 gage staple at 8" o.c. 8-16d common (3 ½" x 0.162") 12-3" x 0.131" nails 12-3" 14 gage staples	typical face nail lap splice	*to new rows 12*
11. Blocking between joists or rafters to top plate	3-8d common (2 ½" x 0.131") 3-3" x 0.131" nails 3-3" 14 gage staples	toenail	*to new row 1*
12. Rim joist to top plate	8d (2 ½" x 0.131") at 6" o.c. 3" x 0.131" nail at 6" o.c. 3" 14 gage staple at 6" o.c.	toenail	*to new row 23*
13. Top plates, laps and intersections	2-16d common (3 ½" x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	face nail	*to new row 18*
14. Continuous header, two pieces	16d common (3 ½" 0.162")	16" o.c. along edge	*to new row 10*
15. Ceiling joists to plate	3-8d common (2 ½" x 0.131") 5-3" x 0.131" nails 5-3" 14 gage staples	toenail	*to new row 2*
16. Continuous header to stud	4-8d common (2 ½" x 0.131")	toenail	*to new row 11*
17. Ceiling joists, laps over partitions (see Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (3 ½" x 0.162") minimum,Table 2308.10.4.1 4-3" x 0.131" nails 4-3" 14 gage staples	face nail	*to new rows 3 and 4*
18. Ceiling joists to parallel rafters (see Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (3 ½" x 0.162") minimum,Table 2308.10.4.1 4-3" x 0.131" nails 4-3" 14 gage staples	face nail	*to new row 4*
19. Rafter to plate (see Section 2308.10-.1, Table 2308.10.1)	3-8d common (2 ½" x 0.131") 3-3" x 0.131" nails 3-3" 14 gage staples	Face nail	*to new row 6*
20. 1" diagonal brace to each stud and plate	2-8d common (2 ½" x 0.131") 2-3" x 0.131" nails 3-3" 14 gage staples	Face nail	*to new row 19*
21. 1" x 8" sheathing to each bearing	3-8d common (2 ½" x 0.131")	face nail	*to new row 21*
22. Wider than 1" x 8" sheathing to each bearing	3-8d common (2 ½" x 0.131")	face nail	*to new row 21*
23. Built-up corner studs	16d common (2 ½" x 0.131") 3" x 0.131" nails 3" 14 gage staples	24" o.c. 16" o.c. 16" o.c.	*to new row 9*
24. Built-up girder and beams	20d common (4" x 0.192") 32" o.c. 3" x 0.131" nails @ 24" o.c. 3" 14 gage staples @ 24" o.c.	face nail at top and bottom staggered on opposite sides	*to new row 27*
	2-20d common (4" x 0.192") 3-3" x 0.131" nails @ 24" o.c. 3-3" 14 gage staples @ 24" o.c.	face nail at ends and at each splice	*to new row 27*
25. 2" planks	16d common (3 ½" x 0.162")	at each bearing	*to new row 26*
26. Collar tie to rafter	3-10d common (3" x 0.148") 4-3" x 0.131" nails 4-3" 14 gage staples	face nail	*to new row 5*
27. Jack rafter to hip	3-10d common (3" x 0.148") 4-3" x 0.131" nails 4-3" 14 gage staples	toenail	*to new row 7*

CONNECTION	FASTENING[a, m]		LOCATION	*Notes:*
	2-16d common (3 ½” x 0.162”) 3-3” x 0.131” nails 3-3” 14 gage staples		face nail	*to new row 7*
28. Roof rafter to 2-by ridge beam	2-16d common (3 ½” x 0.162”) 3-3” x 0.131” nails 3-3” 14 gage staples		toenail	*to new row 7 except 10d common is specified for toe-nail case to match jack to hip nailing.*
	2-16d common (3 ½” x 0.162”) 3-3” x 0.131” nails 3-3” 14 gage staples		face nail	*to new row 7*
29. Joist to band joist	3-16d common (3 ½” x 0.162”) 4-3” x 0.131” nails 4-3” 14 gage staples		face nail	*to new row 29*
30. Ledger strip	3-16d common (3 ½” x 0.162”) 4-3” x 0.131” nails 4-3” 14 gage staples		face nail at each joist	*to new row 28*
31. Wood structural panels and particleboard[b] Subfloor, roof and wall sheathing (to framing)	½” and less	6d[c,l] 2 3/8” x 0.113” nail[n] 1 ¾” 16 gage[o]		*to new row 31*
	19/32” to ¾”	8d[d] or 6d[e] 2 3/8” x 0.113” nail[p] 2” 16 gage[p]		*to new rows 32-33*
	7/8” to 1”	8d[c]		
	1 1/8” to 1 ¼”	10d[d] or 8d[e]		*to new rows 36, 37, 38*
Single floor (combination subfloor-underlayment to framing)	¾” and less	6d[e]		
	7/8” to 1”	8d[e]		
	1 1/8” to 1 ¼”	10d[d] or 8d[e]		
32. Panel siding (to framing)	½” or less	6d[f]		*to new rows 39 and 40*
	5/8”	8d[f]		
33. Fiberboard sheathing[g]	½”	No. 11 gage roofing nail[h] 6d common nail (2” x 0.113”) No. 16 gage staple[i]		*to new row 34*
	25/32”	No. 11 gage roofing nail[h] 8d common nail (2” x 0.113”) No. 16 gage staple[i]		*to new row 35*
34. Interior paneling	¼”	4d[j]		*to new row 41*
	3/8”	6d[k]		*to new row 42*

For SI: 1 inch = 25.4 mm.

a. common or box nails are permitted to be used except where otherwise stated.

b. Nails spaced at 6 inches on center at edges, 12 inches at intermediate supports except 6 inches at supports where spans are 48 inches or more. For nailing of wood structural panel and particleboard diaphragms and shear walls, refer to Section 2305. Nails for wall sheathing are permitted to be common, box or casing.

c. Common or deformed shank (6d-2” x 0.113”; 8d-2 ½” x 0.131”; 10d-3” x 0.148”).

d. Common (6d-2” x 0.113”; 8d-2 ½” x 0.131”; 10d-3” x 0.148”).

e. Deformed shank (6d-2” x 0.113”; 8d-2 ½” x 0.131”; 10d-3” x 0.148”).

f. Corrosion-resistant siding (6d-1 7/8 x 0.106”; 8d-2 3/8” x 0.128”) or casing (6d-2” x 0.099”; 8d-2 ½” x 0.113”) nail.

g. Fasteners spaced 3 inches on center at exterior edges and 6 inches on center at intermediate supports, when used as structural sheathing. Spacing shall be 6 inches on center on the edges and 12 inches on center at intermediate supports for nonstructural applications.

h. Corrosion-resistant roofing nails with 7/16-inch-diameter head and d1 1 1/2"-inch length for ½-inch sheathing and 1 ¾-inch length for 25/32-inch sheathing.

i. Corrosion-resistant staples with nominal 7/16-inch crown or 1-inch crown and 1 ¼-inch length for ½-inch sheathing and 1 ½-inch length for 25/32-inch sheathing. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked).

j. Casing (1 ½” x 0.080”) or finish (1 ½” x 0.072”) nails spaced 6 inches on panel edges, 12 inches at intermediate supports

k. Panel supports at 24 inches. Casing or finish nails spaced 6 inches on panel edges, 12 inches at intermediate supports.

l. For roof sheathing applications, 8d nails (2 ½” x 0.113”) are the minimum required for wood structural panels.

m. Staples shall have a minimum crown width of 7:16 inch.

n. For roof sheathing applications, fasteners spaced 4 inches on center at edges, 8 inches at intermediate supports.

o. Fasteners spaced 4 inches on center at edges, 8 inches at intermediate supports for subfloor and wall sheathing and 3 inches on center at edges, 6 inches at intermediate supports for roof sheathing.
p. Fasteners spaced 4 inches on center at edges, 8 inches at intermediate supports.

(The 2012 IRC fastener schedule is shown below for reference)

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS
		Roof	
1	Blocking between joists or rafters to top plate, toe nail	3-8d ($2^1/_2$″ × 0.113″)	—
2	Ceiling joists to plate, toe nail	3-8d ($2^1/_2$″ × 0.113″)	—
3	Ceiling joists not attached to parallel rafter, laps over partitions, face nail	3-10d	—
4	Collar tie to rafter, face nail or $1^1/_4$″ × 20 gage ridge strap	3-10d (3″ × 0.128″)	—
5	Rafter or roof truss to plate, toe nail	3-16d box nails ($3^1/_2$″ × 0.135″) or 3-10d common nails (3″ × 0.148″)	2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss[j]
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	4-16d ($3^1/_2$″ × 0.135″) 3-16d ($3^1/_2$″ × 0.135″)	—
		Wall	
7	Built-up studs-face nail	10d (3″ × 0.128″)	24″ o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" x 0.135")	12″ o.c.
9	Built-up header, two pieces with $^1/_2$″ spacer	16d ($3^1/_2$″ × 0.135″)	16″ o.c. along each edge
10	Continued header, two pieces	16d ($3^1/_2$″ × 0.135″)	16″ o.c. along each edge
11	Continuous header to stud, toe nail	4-8d ($2^1/_2$″ × 0.113″)	—
12	Double studs, face nail	10d (3″ × 0.128″)	24″ o.c.
13	Double top plates, face nail	10d (3″ × 0.128″)	24″ o.c.
14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d ($3^1/_2$″ × 0.135″)	—
15	Sole plate to joist or blocking, face nail	16d ($3^1/_2$″ × 0.135″)	16″ o.c.
16	Sole plate to joist or blocking at braced wall panels	3-16d ($3^1/_2$″ × 0.135″)	16″ o.c.
17	Stud to sole plate, toe nail	3-8d ($2^1/_2$″ × 0.113″) or 2-16d ($3^1/_2$″ × 0.135″)	— —
18	Top or sole plate to stud, end nail	2-16d ($3^1/_2$″ × 0.135″)	—
19	Top plates, laps at corners and intersections, face nail	2-10d (3″ × 0.128″)	—
20	1″ brace to each stud and plate, face nail	2-8d ($2^1/_2$″ × 0.113″) 2 staples $1^3/_4$″	— —
21	1″ × 6″ sheathing to each bearing, face nail	2-8d ($2^1/_2$″ × 0.113″) 2 staples $1^3/_4$″	— —
22	1″ × 8″ sheathing to each bearing, face nail	2-8d ($2^1/_2$″ × 0.113″) 3 staples $1^3/_4$″	— —
23	Wider than 1″ × 8″ sheathing to each bearing, face nail	3-8d ($2^1/_2$″ × 0.113″) 4 staples $1^3/_4$″	— —
		Floor	
24	Joist to sill or girder, toe nail	3-8d ($2^1/_2$″ × 0.113″)	—
25	Rim joist to top plate, toe nail (roof applications also)	8d ($2^1/_2$″ × 0.113″)	6″ o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½″ × 0.113″)	6″ o.c.
27	1″ × 6″ subfloor or less to each joist, face nail	2-8d ($2^1/_2$″ × 0.113″) 2 staples $1^3/_4$″	— —
28	2″ subfloor to joist or girder, blind and face nail	2-16d ($3^1/_2$″ × 0.135″)	—
29	2″ planks (plank & beam - floor & roof)	2-16d ($3^1/_2$″ × 0.135″)	at each bearing
30	Built-up girders and beams, 2-inch lumber layers	10d (3″ × 0.128″)	Nail each layer as follows: 32″ o.c. at top and bottom and staggered. Two nails at ends and at each splice.
31	Ledger strip supporting joists or rafters	3-16d ($3^1/_2$″ × 0.135″)	At each joist or rafter

(continued)

TABLE R602.3(1)—continued
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER[b, c, e]	SPACING OF FASTENERS	
			Edges (inches)[i]	Intermediate supports[c, e] (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing				
32	$^3/_8$" - $^1/_2$"	6d common (2" × 0.113") nail (subfloor wall)[j] 8d common ($2^1/_2$" × 0.131") nail (roof)[f]	6	12[g]
33	$^{19}/_{32}$" - 1"	8d common nail ($2^1/_2$" × 0.131")	6	12[g]
34	$1^1/_8$" - $1^1/_4$"	10d common (3" × 0.148") nail or 8d ($2^1/_2$" × 0.131") deformed nail	6	12
Other wall sheathing[h]				
35	$^1/_2$" structural cellulosic fiberboard sheathing	$^1/_2$" galvanized roofing nail, $^7/_{16}$" crown or 1" crown staple 16 ga., $1^1/_4$" long	3	6
36	$^{25}/_{32}$" structural cellulosic fiberboard sheathing	$1^3/_4$" galvanized roofing nail, $^7/_{16}$" crown or 1" crown staple 16 ga., $1^1/_2$" long	3	6
37	$^1/_2$" gypsum sheathing[d]	$1^1/_2$" galvanized roofing nail; staple galvanized, $1^1/_2$" long; $1^1/_4$ screws, Type W or S	7	7
38	$^5/_8$" gypsum sheathing[d]	$1^3/_4$" galvanized roofing nail; staple galvanized, $1^5/_8$" long; $1^5/_8$" screws, Type W or S	7	7
Wood structural panels, combination subfloor underlayment to framing				
39	$^3/_4$" and less	6d deformed (2" × 0.120") nail or 8d common ($2^1/_2$" × 0.131") nail	6	12
40	$^7/_8$" - 1"	8d common ($2^1/_2$" × 0.131") nail or 8d deformed ($2^1/_2$" × 0.120") nail	6	12
41	$1^1/_8$" - $1^1/_4$"	10d common (3" × 0.148") nail or 8d deformed ($2^1/_2$" × 0.120") nail	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 Ksi = 6.895 MPa.

a. All nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less.

b. Staples are 16 gage wire and have a minimum $^7/_{16}$-inch on diameter crown width.

c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.

d. Four-foot by 8-foot or 4-foot by 9-foot panels shall be applied vertically.

e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).

f. For regions having basic wind speed of 110 mph or greater, 8d deformed ($2^1/_2$" × 0.120) nails shall be used for attaching plywood and wood structural panel roof sheathing to framing within minimum 48-inch distance from gable end walls, if mean roof height is more than 25 feet, up to 35 feet maximum.

g. For regions having basic wind speed of 100 mph or less, nails for attaching wood structural panel roof sheathing to gable end wall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.

h. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

i. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at all floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof or floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

j. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe nails on one side of the rafter and toe nails from the ceiling joist to top plate in accordance with this schedule. The toe nail on the opposite side of the rafter shall not be required.

Cost Impact: The code change proposal will not increase the cost of construction.

S265-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1-S-BAJNAI-BCAC.doc

S266–12
Table 2304.9.1

Proponent: Paul Coats, American Wood Council (pcoats@awc.org)

Revise as follows:

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING[a,m]		LOCATION
33. Fiberboard sheathing[g]	1/2"	No. 11 gage roofing nail[h] ~~6d common nail (2" × 0.113")~~ No. 16 gage staple[i]	
	25/32"	No. 11 gage roofing nail[h] ~~8d common nail (21/2" × 0.131")~~ No. 16 gage staple[i]	

(Portions of table not shown remain unchanged)

Reason: Recommended fastening for fiberboard sheathing no longer includes 6d common or 8d common nails. Removal of these common nail fastener sizes coordinates with revisions made in the 2008 Special Design Provisions for Wind and Seismic (SDPWS) and 2012 Wood Frame Construction Manual (WFCM) referenced in this code and applicable for design of structural fiberboard shear walls. Specified roofing nails and staples incorporate a larger head/crown size per footnotes h and i for increased head pull-through resistance.

Cost Impact: The code change proposal will not increase the cost of construction.

S266-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1-S-COATS.doc

S267–12
Table 2304.9.1

Proponent: Jay Crandell, ARES Consulting, representing the Foam Sheathing Committee of the American Chemistry Council- Plastics Division (jcrandell@aresconsulting.biz)

Revise as follows:

TABLE 2304.9.1
FASTENING SCHEDULE

7. Top plate to stud	2 - 16d common ($3^{1}/_{2}$" × 0.162") 3 - 3" × 0.131" nails 3 - 3" 14 gage staples	end nail
	4 - 8d common (21/2" × 0.131") 4 - 3" × 0.131" nails 3 - 3" 14 gage staples	toenail

(Portions of table not shown remain unchanged)

Reason: The code already provides a toenail connection option for the stud to bottom plate connection (see Item 8 in the same table). This code change proposal makes requirements consistent for connection of the stud to the top plate. Toe nail connections provide a better uplift load path than end nails, so this option should be provided for both ends of the stud, not just at the bottom end of the stud.

Cost Impact: The code change proposal will not increase the cost of construction.

S267-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T2304.9.1-S-CRANDELL.doc

S268–12

2304.11, 2304.11.1, 2304.11.2, 2304.11.2.1, 2304.11.2.2, 2304.11.2.3, 2304.2.4, 2304.11.2.5, 2304.11.2.6, 2304.11.2.7, 2304.11.3, 2304.11.4, 2304.11.4.1, 2304.11.4.2, 2304.11.5, 2304.11.6, 2304.11.7

Proponent: Dennis Pitts, American Wood Council, (dpitts@awc.org)

Revise as follows:

2304.11 Protection against decay and termites. Wood shall be protected from decay and termites in accordance with the applicable provisions of Sections 2304.11.1 through ~~2304.11.9~~ 2304.11.7.

~~**2304.11.1 General.** Where required by this section, protection from decay and termites shall be provided by the use of naturally durable or *preservative-treated wood*.~~

~~**2304.11.2 Wood used above ground**~~ **2304.11.1 Location requiring water-borne preservatives.** Wood used above ground in the locations specified in Sections ~~2304.11.2.1~~ 2304.11.1.1 through ~~2304.11.2.7~~ 2304.11.1.5, 2304.11.3 and 2304.11.5 shall be naturally durable wood or *preservative-treated wood* using water-borne preservatives, in accordance with AWPA U1 ~~(Commodity Specifications A or F)~~ for above-ground use.

~~**2304.11.2.1**~~ **2304.11.1.1 Joists, girders and subfloor.** ~~Where~~ Wood joists or ~~the bottom of~~ a wood structural floor ~~without joists are~~ closer than 18 inches (457 mm), or wood girders ~~are~~ closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation~~, the floor construction (including posts, girders, joists and subfloor)~~ shall be of naturally durable or *preservative-treated wood*.

~~**2304.11.2.2**~~ **2304.11.1.2 Wood supported by exterior foundation walls.** Wood framing members, including wood sheathing, that ~~rest on~~ are in contact with exterior foundation walls and are less than 8 inches (203 mm) from exposed earth shall be of naturally durable or *preservative-treated wood*.

~~**2304.11.2.3**~~ **2304.11.1.3 Exterior walls below grade.** Wood framing members and furring strips ~~attached directly to~~ in direct contact with the interior of exterior masonry or concrete walls below grade shall be of naturally durable or *preservative-treated wood*.

~~**2304.11.2.4**~~ **2304.11.1.4 Sleepers and sills.** Sleepers and sills on a concrete or masonry slab that is in direct contact with earth shall be of naturally durable or *preservative-treated wood*.

~~**2304.11.2.6**~~ **2304.11.1.5 Wood siding.** Clearance between wood siding and earth on the exterior of a building shall not be less than 6 inches (152 mm) or less than 2 inches (51 mm) vertical from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather except where siding, sheathing and wall framing are of naturally durable or *preservative-treated wood*.

2304.11.2 Other locations. Wood used in the locations specified in Sections 2304.11.2.1 through 2304.11.2.5 shall be naturally durable wood or *preservative treated wood* in accordance with AWPA U1. Preservative treated wood used in interior locations shall be protected with two coats of urethane, shellac, latex epoxy, or varnish unless waterborne preservatives are used. Prior to application of the protective finish, the wood shall be dried in accordance with the manufacturer's recommendations.

~~**2304.11.2.5**~~ **2304.11.2.1 Girder ends.** The ends of wood girders entering exterior masonry or concrete walls shall be provided with a 1/2-inch (12.7 mm) air space on top, sides and end, unless naturally durable or pr*eservative-treated wood* is used.

~~2304.11.2.7~~ **2304.11.2.2 Posts or columns.** Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth shall be of naturally durable or *preservative-treated wood*.

Exceptions:

~~1.~~ Posts or columns that are ~~either~~ not exposed to the weather ~~or located in basements or cellars,~~ are supported by concrete piers or metal pedestals projected at least 1 inch (25 mm) above the slab or deck and ~~6~~ 8 inches (152 mm) above exposed earth, and are separated ~~therefrom~~ by an impervious moisture barrier.

~~2. Posts or columns in enclosed crawl spaces or unexcavated areas located within the periphery of the building, supported by a concrete pier or metal pedestal at a height greater than 8 inches (203 mm) from exposed ground, and are separated therefrom by an impervious moisture barrier.~~

~~2304.11.5~~ **2304.11.2.3 Supporting member for permanent appurtenances.** Naturally durable or *preservative-treated wood* shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering to prevent moisture or water accumulation on the surface or at joints between members.

Exception: When a building is located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather.

~~2304.11.3~~ **2304.11.2.4 Laminated timbers.** The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be pressure treated with preservative or be manufactured from naturally durable or *preservative-treated wood*.

2304.11.2.5. Supporting members for permeable floors and roofs. Wood structural members that support moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, shall be of naturally durable or *preservative-treated wood* unless separated from such floors or roofs by an impervious moisture barrier.

~~2304.11.4~~ **2304.11.3 Wood in contact with the ground or fresh water.** Wood used in contact with the ground (exposed earth) ~~in the locations specified in Sections 2304.11.4.1 and 2304.11.4.2~~ shall be naturally durable (species for both decay and termite resistance) or preservative treated ~~using water-borne preservatives~~ in accordance with AWPA U1 ~~(Commodity Specifications A or F)~~ for soil or fresh water use.

Exception: Untreated wood is permitted where such wood is continuously and entirely below the groundwater level or submerged in fresh water.

~~2304.11.4.1~~ **2304.11.3.1 Posts or columns.** Posts and columns supporting permanent structures that are embedded in concrete that is ~~in direct contact with the earth, embedded in concrete that is~~ exposed to the weather or in direct contact with the earth shall be of *preservative-treated wood*.

~~**2304.11.4.2 Wood structural members.** Wood structural members that support moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, shall be of naturally durable or *preservative-treated wood* unless separated from such floors or roofs by an impervious moisture barrier.~~

~~2304.11.6~~ **2304.11.4 Termite protection.** In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing in the locations specified in Section 2304.11.1.1 and exposed framing of exterior decks or balconies shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with *approved* methods of termite protection.

~~2304.11.7~~ 2304.11.5 Wood used in retaining walls and cribs. Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 ~~(Commodity Specifications A or F)~~ for soil and fresh water use.

Reason: This code change contains few technical changes but addresses many editorial clean-ups and some re-organization. The technical change is a delineation of exactly where waterborne preservatives should be required and where they should not. In a reorganization of this section in the 2005 code change cycle, glued laminated and certain exterior applications were lumped under a general section for the purposes of citing the new AWPA U1 standard, but a requirement for waterborne preservatives was inadvertently imposed for all applications in that reorganization. This proposed code change restores the ability for glued laminated beams and wood in exterior applications to be treated with other-than waterborne preservatives in accordance with the U1 standard. As a precaution, a requirement for the drying of treated wood and its sealing was added where used on the interior of a building (proposed section 2304.11.2).

Other changes are explained as follows:

Existing section 2304.11.1 deletion: This section became superfluous.

Proposed 2304.11.1: Section references are changed, and the specific mention of commodity specifications in the U1 standard was deleted because it is unnecessary.

Proposed 2304.11.1.1: Removing "the floor construction (including posts, girders, joists and subfloor)" makes it clear that only those floor elements within proximity to exposed ground need to be protected.

Proposed 2304.11.1.2: Better wording to meet current intent.

Proposed 2304.11.1.3: Better wording to meet current intent.

Proposed 2304.11.2: This new section is needed to introduce the subsections for locations where other-than waterborne preservatives are permitted under certain circumstances, as long as treatment is in accordance with the AWPA U1 standard.

Proposed 2304.11.2.2 Exceptions: The first exception was worded incorrectly and would seem to exempt exposed wood from protection; the proposed wording is a fix. With Exception 1 fixed, exception 2 was so similar in requirement that it was combined with Exception 1 and the clearance dimension was changed from 6 to 8 inches to preserve the intent of the deleted exception and be consistent with the clearance required for wood supported by exterior foundation walls in proposed Section 2304.11.1.2.

Proposed 2304.11.2.5: This is not a new section, but is re-titled and moved up in the text from Section 2304.11.4.2 (shown struck-out further down). There is no obvious reason why it must be a subsection of current 2304.11.4.

Proposed 2304.11.3: The requirement that water-borne preservatives be used exclusively has been struck in accordance with the purpose of this change, which indicates those locations where water-borne preservatives must be used up in proposed Section 2304.11.1 and subsections.

Existing section 2304.11.4.1 and 2304.11.4.2 (shown struck out): These were not lost. The current 2304.11.4.2 was moved up to become proposed 2304.11.2.5, and the current 2304.11.4.1 became 2304.11.3.1 with some editorial rewording for clarity.

Cost Impact: The code change proposal will not increase the cost of construction.

S268-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.11-S-PITTS.doc

S269–12
2304.11.2, 2304.11.3, 2304.11.4, 2304.11.5, 2304.11.7

Proponent: Paul Coats, P.E., CBO, American Wood Council (pcoats@awc.org)

Revise as follows:

2304.11.2 Wood used above ground. Wood used above ground in the locations specified in Sections 2304.11.2.1 through 2304.11.2.7, ~~2304.11.3 and 2304.11.5~~ shall be naturally durable wood or *preservative-treated wood* using water-borne preservatives, in accordance with AWPA U1 ~~(Commodity Specifications A or F)~~ for above-ground use.

2304.11.3 Laminated timbers. The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be ~~pressure~~ preservative treated ~~with preservative~~ in accordance with AWPA U1 or be manufactured from naturally durable or *preservative-treated wood*.

Unless waterborne preservatives are used, preservative treated glued laminated timbers used in interior locations shall be protected with two coats of urethane, shellac, latex epoxy, or varnish. Prior to application of the protective finish, the wood shall be dried in accordance with the manufacturer's recommendations.

2304.11.4 Wood in contact with the ground or fresh water. Wood used in contact with the ground (exposed earth) in the locations specified in Sections 2304.11.4.1 and 2304.11.4.2 shall be naturally durable (species for both decay and termite resistance) or preservative treated using water-borne preservatives in accordance with AWPA U1 ~~(Commodity Specifications A or F)~~ for soil or fresh water use.

> **Exception:** Untreated wood is permitted where such wood is continuously and entirely below the groundwater level or submerged in fresh water.

2304.11.5 Supporting member for permanent appurtenances. Naturally durable wood or wood that is *preservative-treated* ~~*wood*~~ in accordance with AWPA U1 shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering to prevent moisture or water accumulation on the surface or at joints between members.

> **Exception:** When a building is located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather.

2304.11.7 Wood used in retaining walls and cribs. Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 ~~(Commodity Specifications A or F)~~ for soil and fresh water use.

Reason: It is common practice for glued-laminated structural members to be treated with other than water-borne preservatives. In the 2006 IBC, a change was introduced which re-organized the preservative treated wood section and inadvertently imposed a water-borne preservative mandate on glued laminated timbers and exterior applications of other structural members (see code change S51-03/04). The reason for the original change was to bring all applications under the new AWPA U1 standard. This proposed change retains the intent of having the U1 standard apply to all applications but enables current industry practice for the use of other preservatives for exterior and glued-laminated applications. As a precaution against air quality concerns, wording is introduced to require the drying and sealing of glued laminated members when used in interior applications, if water-borne preservatives are not used. Also, the limitation to Commodity Specifications A or F is no longer necessary since the standard now clearly indicates the applicability limits of its various specifications.

Cost Impact: The code change proposal will not increase the cost of construction.

S269-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.11.2-S-COATS.doc

S270–12
2304.11.2.1

Proponent: Edward L. Keith, P.E., APA The Engineered Wood Association (ed.keith@apawood.org)

Revise as follows:

2304.11.2.1 Joists, girders and subfloor. Where wood joists or the bottom of a wood structural floor without joists are closer than 18 inches (457 mm), or wood girders are closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation, the floor construction (including posts, girders, joists and subfloor) shall be of naturally durable or *preservative-treated wood*.

> **Exception:** The clearance between the wood floor joists or the bottom of a wood structural floor without joists and the exposed ground shall be permitted to be reduced to 12 inches in areas where all of the following conditions have been met:
>
> 1. The grade within the perimeter of the foundation slopes away from the floor framing in such a way as to make all of the floor joists, the bottom of a wood structural floor without joists, and girders readily accessible,
> 2. The average distance between grade and the bottom of the wood floor joists or the bottom of a wood structural floor without joists is at least 18", and
> 3. The foundation is ventilated in accordance with Section 1203.3.

Reason: The purpose of this proposal is to reduce the raised-wood floor clearance height only in those areas that doing so will not adversely impact the long-term performance of the floor system. The provisions of this exception accomplish two things:

1) It recognizes the method of floor construction whereby the floor joists are face-mounted to the side of the girders and occupy the same depth as the girder. As such, both portions of the system would have the same clearance above grade. If 12 inches of clearance from grade provides sufficient moisture separation for girders, the same distance will provide sufficient moisture separation for floor joists as well.

2) Recognizing that at least part of the reason for requiring 18 inches of clearance under floor joists is to provide accessibility to the underside of the floor, permitting the separation to be reduced to 12 inches can only be made under three conditions specified to maintain access to the under-floor area and still provide sufficient ventilation to insure the serviceability of the floor system through moisture control. These conditions are as follows:
   a. This reduction in separation for the floor joists or the bottom of a wood structural floor without joists is only permitted in foundations where the ground slopes away from the floor in a way such that only readily accessible portions of the floor may meet this reduced separation requirement.
   b. The minimum average clearance requirement is provided to insure sufficient slope is present to provide the ready accessibility to the portions of the floor meeting the new reduced clearance to grade requirement.
   c. This exception is applicable only to those under-floor spaces meeting the ventilation requirements of Section 1203.3.

It is anticipated that this exception as written will provide some cost savings to buildings constructed on sloped sites by reducing the crawl space height dictated by a small percent of the floor area while providing similar accessibility and serviceability as is intended by the Section 2304.11.2.1.

It also recognizes the increasingly common low profile floors whereby the floor joists are hung off of the sides of the floor girders. These are becoming increasingly popular as builders discover the availability of engineered wood beams made in I-joist-compatible depths. The use of such beams and girders had the potential to reduce first-floor elevations by 6 to 9 inches with a corresponding savings in labor and construction materials.

Cost Impact: The code change proposal will not increase the cost of construction.

S270-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.11.2.1-S-KEITH.doc

S271–12
2304.11.2.7

Proponent: Dennis Pitts, American Wood Council, (dpitts@awc.org)

Revise as follows:

2304.11.2.7 Posts or columns. Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth shall be of naturally durable or *preservative-treated wood*.

Exception:

~~1.~~ Posts or columns that are ~~either~~ not exposed to the weather ~~or located in basements or cellars,~~ and are supported by concrete piers or metal pedestals projected at least 1 inch (25 mm) above the slab or deck and ~~6 inches (152 mm)~~ 8 inches (203 mm) above exposed earth, and are separated therefrom by an impervious moisture barrier.

~~2. Posts or columns in enclosed crawl spaces or unexcavated areas located within the periphery of the building, supported by a concrete pier or metal pedestal at a height greater than 8 inches (203 mm) from exposed ground, and are separated therefrom by an impervious moisture barrier.~~

Reason: The current wording of Exception 1 conflicts with requirements in 2304.11.3 and 2304.11.5 and is technically incorrect. Those sections make it clear that all posts or columns exposed to the weather must be protected, regardless of location. The proposed wording removes any confusion. Exceptions 1 and 2 are very similar and with the proposed clean-up of the first exception, the second is superfluous except for the dimension of 8 inches, which differs from the 6-inch dimension in Exception 1. For consistency with other requirements such as for wood supported by exterior foundation walls in 2304.11.2.2, the 8-inch clearance dimension is preferable.

A comparable revision is made as part of the general cleanup and reorganization of this section proposed by AWC in a separate proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

S271-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2304.11.2.7-S-PITTS.doc

S272–12
2301.2, 2308

Proponent: Charles S. Bajnai, Chesterfield County, VA, (bajnaic@chesterfield.gov)

Revise as follows:

2301.2 General design requirements. The design of structural elements or systems, constructed partially or wholly of wood or wood-based products, shall be in accordance with one of the following methods:

1. *Allowable stress design* in accordance with Sections 2304, 2305 and 2306.
2. *Load and resistance factor design* in accordance with Sections 2304, 2305 and 2307.
3. *Conventional light-frame construction* in accordance with Sections 2304 and 2308.

   Exceptions:

   1. Buildings designed in accordance with the provisions of the AF&PA WFCM shall be deemed to meet the requirements of the provisions of Section 2308.
   2. Buildings designed in accordance to the prescriptive structural provisions of the International Residential Code, shall be permitted in accordance with Section 2303 limitations.

4. The design and construction of log structures shall be in accordance with the provisions of ICC 400.

Delete and substitute as follows:

~~**SECTION 2308**~~
~~**CONVENTIONAL LIGHT-FRAME CONSTRUCTION**~~

SECTION 2308
CONVENTIONAL LIGHT-FRAME CONSTRUCTION

2308.1 General. For purposes of defining the structural requirements for buildings using conventional light-frame construction, the International Residential Code (IRC) shall be permitted to be used. The limitations for height, area, egress and the necessity for sprinklers are not to be modified. If there are differences encountered between the IBC and the IRC, the IBC or accepted engineering practice shall govern.

Other construction methods are permitted to be used in accordance with Section 2301.2.

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of this section and the International Residential Code subject to the following limitations:

1. Buildings shall be limited to a maximum of three stories above grade plane.
2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches in height. Bearing wall height shall not exceed a stud height of 12 feet.
3. Live load for floors shall not exceed 40 psf when built on conventional light-frame construction.
4. V_{asd} shall be 109 mph or less.
5. Structures of Risk Category I, II, or III.
6. Seismic Design Category A thru D_2. Structures in SDC E shall conform to the wall bracing requirements of Seismic Design Category D_2 as established in the IRC.

2308.3. Climatic and Geographic Design Criteria. The Climatic and Geographic Design Criteria in IRC Table R301.2(1) and the related maps and tables shall be applied.

Reason: There are intrinsic deficiencies in the IBC, Section 2308.

I. IBC Section 2308 is prescriptive code. It tells the designer everything from anchor bolt location and sizes to floor joist, ceiling joist and header tables. What is the difference between house construction and a small office building constructed of wood? My contention is that there is nothing different. This code change is intended to tell the designer/builder that the requirements for *conventional light-frame construction* are sufficient for the buildings and structure within the scope of the IRC and are equally sufficient for other buildings and structures other than one and two family dwellings.

II. IBC Section 2308 has numerous technical flaws in its engineering, namely:

1. The wall bracing requirements were set up in the IBC for seismic events, not wind events. What this means is that the building exposed to wind events (more than half of the country) may be adequately strong in its long dimension, but weak/under designed in its narrow dimension. See example at the end of this reason statement.
2. The IBC does not take into consideration that the lateral loads are accumulative from the upper floors down to the lower floors. All of the floors are treated as if they are the same with respect to the amount of bracing required. This is not a true phenomenon.
   The IRC addresses this in both the wind and seismic tables – the length of bracing on the lower levels is more than the bracing required on the upper levels.
3. The IBC does not specify the minimum length of bracing required. Instead, it has a table, 2308.9.3.1 which shows "X" for the methods allowed and references back to the location requirement of not more than 12.5 feet from braced wall corners. The IBC tries to control the required length of bracing based on the panel spacing – this is like trying to control gas mileage of a car based on the tire size…they just don't have too much influence on each other.

III. IBC Section 2308 does not allow the engineer/builder to gain the benefits of other advancements that have been added to the IRC, namely:

1. There are wall bracing methods in the IRC that should be available to structures using the IBC, namely, continuous wall bracing methods. The current IBC provides no benefit for continuously sheathing the exterior of the structure.
2. The IRC actually allows for stud height of 12 feet. The IBC limitations in Section 2308 limits stud heights to 10 feet.
3. In the IBC there is no difference if the wind is ≤90 mph (over half of the country) or <110 mph. By inference then, the IBC provisions must be designing for the worst case situation for all structures.

The Ad-hoc Committee on Wall Bracing (AHWB) spent over five years getting the 2012 IRC to correctly reflect the technical differences between wind and seismic events. The rules are different and the amount of bracing required is different depending on which event governs.

Unfortunately, the IBC was not in the purview of the AHWB committee. Therefore no effort was put into coordinating the IRC with the IBC. Part of the problem had to deal with the fact that the wind and seismic provisions in the IBC are based on ASCE 7 while the wind and seismic provisions in the IRC are based on prescriptive maps.

This code change is not intended to change or negate any of the height and area nor the egress requirements, in the IBC. Likewise, this code change is not intended to say that all structures using the IRC must now be sprinklered. This code change is intended to say that the prescriptive requirements in the IRC can be used for of structures besides houses.

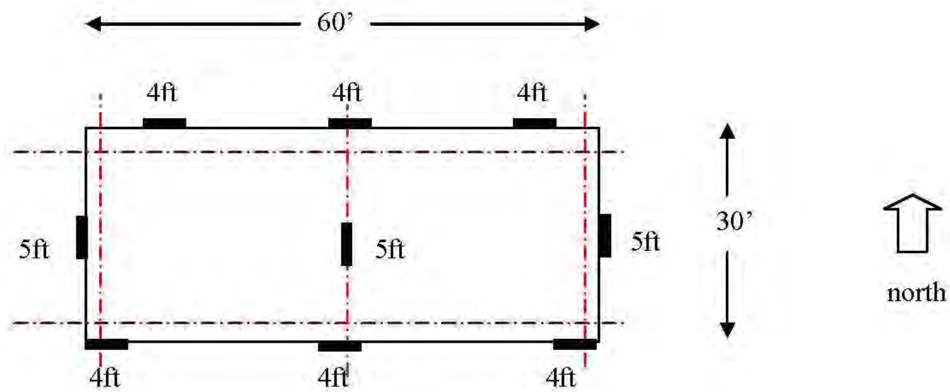
Why not just copy the IRC tables into the IBC?

Some experts may suggest that if the IBC is flawed then the wall bracing requirements in the IRC should be copied over in their entirety to the IBC. It is nearly impossible to just drop the wind tables and seismic tables directly into the IBC; the two books do not have a hand and glove relationship - they are better off remaining distinct.

The AHWC committee in its effort to be more flexible took the six pages from Section R602.10 in the 2006 IRC and made it into thirty pages in the 2012 IRC. Do we really want to do this again??? Even if we did, copying the IRC wall bracing provisions into the IBC does not rectify the original prescriptive language problem inherent in Section 2308.

Example of the difference between the IRC and the IBC with regard to wall bracing assuming most liberal code allowances:

Example of the difference between the IRC and the IBC with regard to wall bracing assuming most liberal code allowances:



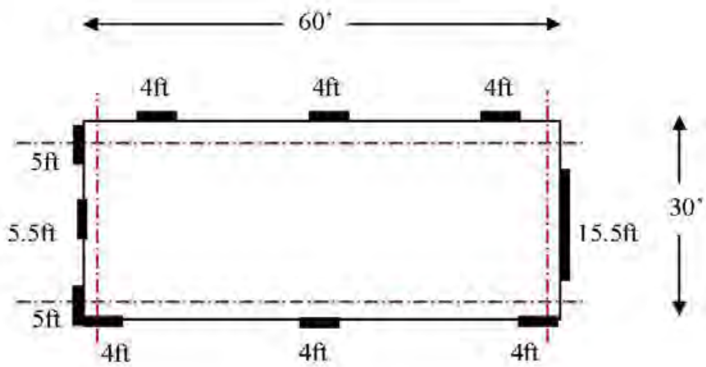
Parameters:
One Story, Exposure B, SDC B, Wind Speed <110 mph
Wall height 10', Eve to ridge height 10
Using wood structural panels (method 3)

According to the IBC
Braced wall lines: max spacing for SDC B = 35'
Braced wall lines may be offset from actual walls ≤ 4'

Braced wall panels must be within 12.5' of the end of the structure
Braced wall panel spacing may not exceed 25' o.c.

According to the IBC parameters,

- Long side: minimum 12' of bracing x 2 sides = 24' total bracing to resist wind blowing east/west
- Short side: minimum 5' of bracing x 3 lines = 15' total bracing to resist wind blowing north/south



Parameters:
One Story, Exposure B, SDC B, Wind Speed <110 mph
Wall height 10', Eve to ridge height 10
Using wood structural panels (WSP)

According to the IRC
Braced wall lines: max spacing for SDC B = 60'
Braced wall lines may be offset from actual walls ≤ 4'

Braced wall panels must be within 10' of the end of the structure
Braced wall panel spacing may not exceed 20' end to end.

According to the IRC parameters,

- Long side: minimum tabular length required is 8.5', but braced wall panel spacing governs so 12' is the minimum length x 2 sides = 24' total bracing to resist wind blowing east/west
- Short sides: minimum tabular length required is 15.5' x 2 sides = 31' total bracing to resist wind blowing north/south

Conclusion:
The length of bracing for this one example shows that if wind is blowing north/south against the long face of the structure, the IBC has under designed the length of bracing required over fifty percent.

This code change is good for the IBC and should be passed.

Conclusion:
The length of bracing for this one example shows that if wind is blowing north/south against the long face of the structure, the IBC has under designed the length of bracing required over fifty percent. **This code change is good for the IBC and should be passed.**

Cost Impact: The impact of this change could be a significant cost reduction by allowing the prescriptive code to be used on small commercial projects that would otherwise require an engineered design. The exact amount of savings will be dependent on the cost of the architectural/engineering services. The cost of the construction should be the same.

S272-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2301-S-BAJNAI-RICE.doc

S273–12
2308 (NEW)

Proponent: Robert Rice, Josephine County, OR (structdesigner@yahoo.com)

Delete and substitute as follows:

~~**SECTION 2308**~~
~~**CONVENTIONAL LIGHT-FRAME CONSTRUCTION**~~

SECTION 2308
CONVENTIONAL LIGHT-FRAME CONSTRUCTION

2308.1 General. The requirements of this section are intended for *conventional light-frame construction*. Other construction methods are permitted to be used, provided a satisfactory design is submitted showing compliance with other provisions of this code. Interior non-load-bearing partitions, ceilings and curtain walls of *conventional light-frame construction* are not subject to the limitations of section 2308.2. Alternatively, compliance with AF&PA WFCM shall be permitted subject to the limitations therein and the limitations of this code. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three *stories above grade plane* in height with a separate *means of egress* and their accessory structures shall comply with the *International Residential Code*.

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of *conventional light-frame construction*, subject to the following limitations;

2308.2.1 Stories. Structures of *conventional light-frame construction* shall be limited in story height according to Table 2308.2.1

TABLE 2308.2.1
ALLOWABLE STORY HEIGHT

Seismic Design Category	Allowable Story above grade plane
A and B	Three stories
C	Two Stories
D and E [a]	One story

a. For the purposes of this section, for buildings assigned to *Seismic Design Category* D or E, cripple walls shall be considered to be a *story* unless cripple walls are solid blocked and do not exceed 14 inches in height,

2308.2.2 Allowable floor-to-floor height. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm). Exterior bearing wall and interior braced wall heights shall not exceed a stud height of 10 feet (3048 mm).

2308.2.3 Allowable Loads. Loads shall be in accordance with Chapter 16 and shall not exceed the following:

1. Average dead loads shall not exceed 15 psf (718 N/m^2) for combined roof and ceiling, exterior walls, floors and partitions.

   Exceptions:

   1. Subject to the limitations of Section 2308.6.10.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m^2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.

2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.

2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors.
3. Ground snow loads shall not exceed 50 psf (2395 N/m^2).

2308.2.4 Allowable wind speed. V_{asd} as determined in accordance with Section 1609.3.1 shall not exceed 100 miles per hour (mph) (44 m/s) (3-second gust).

Exceptions:

1. V_{asd} as determined in accordance with Section 1609.3.1 shall not exceed 110 mph (48.4 m/s) (3-second gust) for buildings in Exposure Category B that are not located in a *hurricane-prone region*.
2. Where V_{asd} as determined in accordance with Section 1609.3.1 exceeds 100 mph (3-second gust), the provisions of either AF&PA WFCM or ICC 600 are permitted to be used. Wind speeds in Figures 1609A, 1609B, and 1609C shall be converted in accordance with Section 1609.3.1 for use with AF&PA WFCM or ICC 600.

2308.2.5 Allowable roof span. Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.

2308.2.6 Risk Category limitation. The use of the provisions for *conventional light-frame construction* in this section shall not be permitted for *Risk Category* IV buildings, as determined by Section 1604.5, assigned to *Seismic Design Category* B, C, D or E.

2308.2.7 Portions exceeding limitations of conventional light-frame construction. When portions of a building of otherwise conventional light-frame construction exceed the limits of Section 2308.2, those portions and the supporting load path shall be designed in accordance with accepted engineering practice and the provisions of this code. For the purposes of this section, the term “portions” shall mean parts of buildings containing volume and area such as a room or a series of rooms. The extent of such design need only demonstrate compliance of the non-conventionally light-framed elements with other applicable provisions of this code and shall be compatible with the performance of the conventional light-framed system.

2308.3 Foundations and footings. Foundations and footings shall be designed and constructed in accordance with Chapter 18 . Connections to foundations and footings shall comply with this section.

2308.3.1 Foundation plates or sills. Foundation plates or sills resting on concrete or masonry foundations shall comply with Section 2304.3.1. Foundation plates or sills shall be bolted or anchored to the foundation with not less than 1/2-inch-diameter (12.7 mm) steel bolts or *approved* anchors spaced to provide equivalent anchorage as the steel bolts. Along *braced wall lines* in structures assigned to *Seismic Design Category* E, steel bolts with a minimum nominal diameter of 5/8 inch (15.9 mm) or approved anchor straps load rated in accordance with Section 1706.1 and spaced to provide equivalent anchorage shall be used. Bolts shall be embedded at least 7 inches (178 mm) into concrete or masonry.

Bolts shall be spaced not more than 6 feet (1829 mm) apart and there shall be a minimum of two bolts or anchor straps per piece with one bolt or anchor strap located not more than 12 inches (305 mm) or less than 4 inches (102 mm) from each end of each piece. Bolts in *braced wall lines* in structures over two stories above grade shall be spaced not more the 4 feet (1219 mm) o.c.. A properly sized nut and washer shall be tightened on each bolt to the plate.

2308.3.2 Braced wall line sill plate anchorage in *Seismic Design Category* D and E. Sill plates along *braced wall lines* shall be anchored with anchor bolts with steel plate washers between the foundation sill plate and the nut, or *approved* anchor straps load rated in accordance with Section 1706.1. Such washers shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 1-3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

2308.4 Floor framing. Floor framing shall comply with this section.

2308.4.1 Girders. Girders for single-story construction or girders supporting loads from a single floor shall not be less than 4 inches by 6 inches (102 mm by 152 mm) for spans 6 feet (1829 mm) or less, provided that girders are spaced not more than 8 feet (2438 mm) o.c. Spans for built-up 2-inch girders shall be in accordance with Table 2308.4.1(1) or 2308.4.1(2). Other girders shall be designed to support the loads specified in this code. Girder end joints shall occur over supports.

Where a girder is spliced over a support, an adequate tie shall be provided. The ends of beams or girders supported on masonry or concrete shall not have less than 3 inches (76 mm) of bearing.

~~TABLE 2308.9.5~~ TABLE 2308.4.1(1)
HEADER AND GIRDER SPANS[a] FOR EXTERIOR BEARING WALLS
(Maximum Spans for Douglas Fir-Larch, Hem-Fir, Southern Pine and Spruce-Pine-Fir[b] and Required Number of Jack Studs)

(Portions of table not shown remain unchanged)

~~TABLE 2308.9.6~~ TABLE 2308.4.1(2)
HEADER AND GIRDER SPANS[a] FOR INTERIOR BEARING WALLS
(Maximum Spans for Douglas Fir-Larch, Hem-Fir, Southern Pine and Spruce-Pine-Fir[b] and Required Number of Jack Studs)

(Portions of table not shown remain unchanged)

2308.4.2 Floor joists. Floor joists shall comply with this section.

2308.4.2.1 Span. Spans for floor joists shall be in accordance with Tables 2308.4.2.1(1) or 2308.4.2.1(2) or the *AF&PA Span Tables for Joists and Rafters*.

2308.4.2.2 Bearing. The ends of each joist shall not have less than 1-1/2 inches (38 mm) of bearing on wood or metal, or not less than 3 inches (76 mm) on masonry, except where supported on a 1-inch by 4-inch (25.4 mm by 102 mm) ribbon strip and nailed to the adjoining stud,

2308.4.2.3 Framing details. Joists shall be supported laterally at the ends and at each support by solid blocking except where the ends of the joists are nailed to a header, band or rim joist or to an adjoining stud or by other means. Solid blocking shall not be less than 2 inches (51mm) in thickness and the full depth of the joist. Joist framing from opposite sides of a beam, girder or partition shall be lapped at least 3 inches (76 mm) or the opposing joists shall be tied together in an approved manner. Joists framing into the side of a wood girder shall be supported by framing anchors or on ledger strips not less than 2 inches by 2 inches (51 mm by 51 mm).

TABLE ~~2308.8(1)~~ 2308.4.2.1(1)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
(Residential Sleeping Areas, Live Load = 30 psf, L/Δ = 360)
(Portions of table not shown remain unchanged)

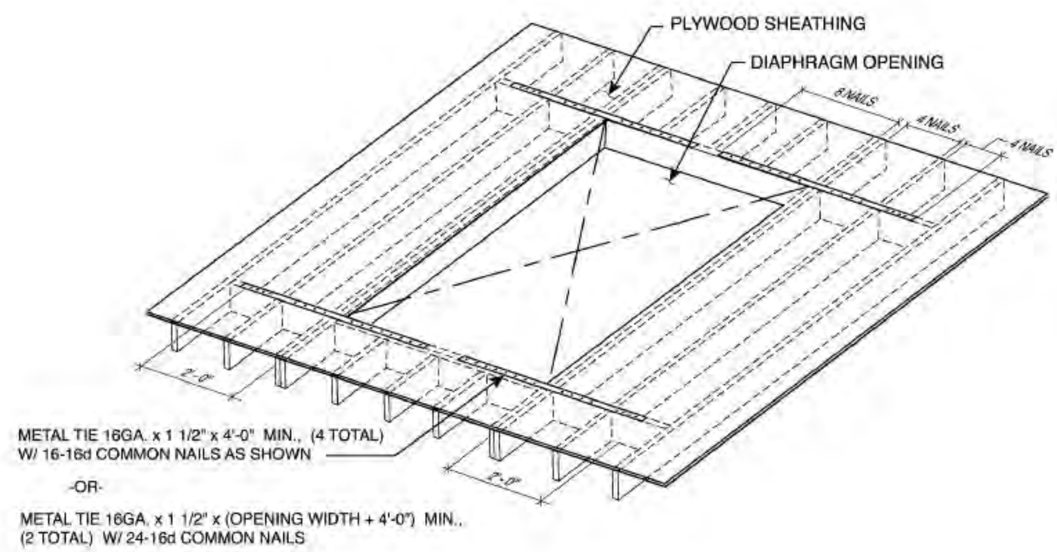
TABLE ~~2308.8(2)~~ 2308.4.2.1(2)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
(Residential Living Areas, Live Load = 40 psf, L/Δ = 360)
(Portions of table not shown remain unchanged)

2308.4.2.4 Notches and holes. Notches on the ends of joists shall not exceed one-fourth the joist depth. Notches in the top or bottom of joists shall not exceed one sixth the depth and shall not be located in the middle third of the span. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist and the diameter of any such hole shall not exceed one-third the depth of the joist.

2308.4.3 Engineered wood products. Engineered wood products shall be installed in accordance with manufacturer's recommendations. Cuts, notches and holes bored in trusses, structural composite lumber, structural glue-laminated members or I-joists are not permitted except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a *registered design professional*.

2308.4.4 Framing around openings. Trimmer and header joists shall be doubled, or of lumber of equivalent cross section, where the span of the header exceeds 4 feet (1219 mm). The ends of header joists more than 6 feet (1829 mm) long shall be supported by framing anchors or joist hangers unless bearing on a beam, partition or wall. Tail joists over 12 feet (3658 mm) long shall be supported at the header by framing anchors or on ledger strips not less than 2 inches by 2 inches (51 mm by 51 mm).

2308.4.4.1 Openings in floor diaphragms in *Seismic Design Categories* B, C, D and E. Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1219 mm) shall be constructed with metal ties and blocking in accordance with this section and Figure 2308.4.4.1(1). Metal ties shall not be less than 0.058 inch [1.47 mm (16 galvanized gage)] thick by 1-1/2 inches (38 mm) wide with a minimum yield stress of 33,000 psi (227 Mpa). Blocking shall be provided 2 feet minimum beyond headers. Ties shall be attached to blocking with eight 16d common nails on each side of the header-joist intersection.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE 2308.4.4.1(1)
OPENINGS IN FLOOR AND ROOF DIAPHRAGMS

Openings in floor diaphragms in *Seismic Design Categories D and E* shall not exceed a dimension greater than 50 percent of the distance between braced wall lines or an area greater than 25 percent of the area between orthogonal pairs of braced wall lines [see Figure 2308.4.4.1(2)], or shall be designed in accordance with accepted engineering practice.

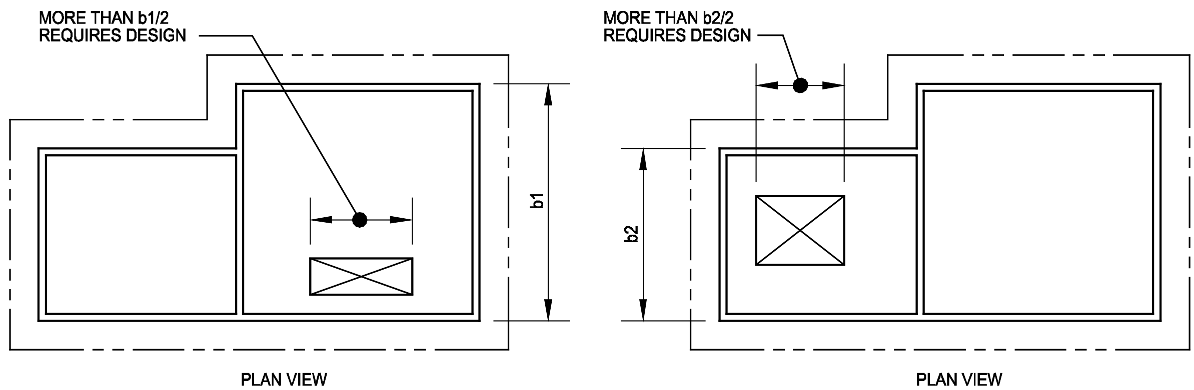


FIGURE 2308.4.4.1(2)
OPENING LIMITATIONS FOR FLOOR AND ROOF DIAPHRAGMS

2308.4.4.2 Vertical offsets in floor diaphragms in *Seismic Design Categories* D and E. Portions of a floor level shall not be vertically offset such that the framing members on either side of the offset cannot be lapped or tied together in an *approved* manner in accordance with Figure 2308.4.4.2.

> **Exception:** Framing supported directly by foundations need not be lapped or tied directly together.

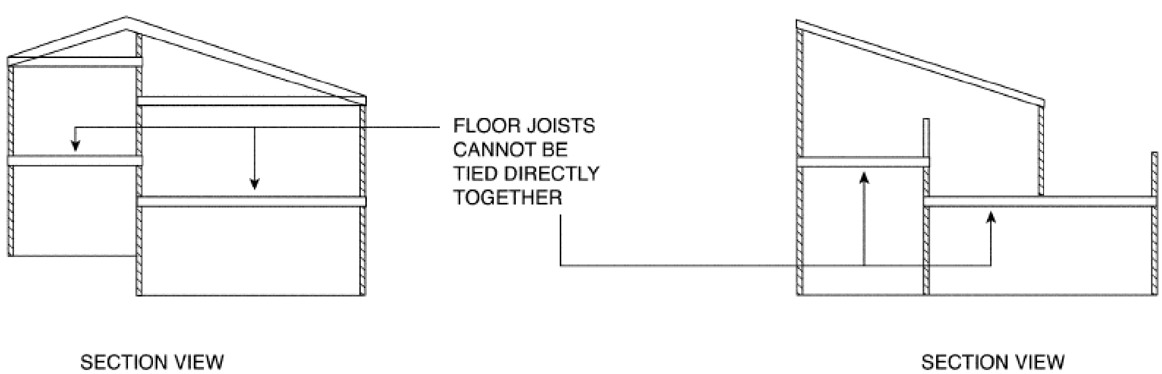


FIGURE 2308.4.4.2
PORTIONS OF FLOOR LEVEL OFFSET VERTICALLY

2308.4.5 Joists supporting bearing partitions. Bearing partitions parallel to joists shall be supported on beams, girders, doubled joists, walls or other bearing partitions. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth unless such joists are of sufficient size to carry the additional load.

2308.4.6 Lateral support. Floor and ceiling framing with a nominal depth-to-thickness ratio greater than or equal to 5:1 shall have one edge held in line for the entire span. Where the nominal depth-to- thickness ratio of the framing member exceeds 6:1, there shall be one line of bridging for each 8 feet (2438 mm) of span, unless both edges of the member are held in line. The bridging shall consist of not less than 1-inch by 3-inch (25 mm by 76 mm) lumber, double nailed at each end, of equivalent metal bracing of equal rigidity, full-depth solid blocking or other *approved* means. A line of bridging shall also be required at supports where equivalent lateral support is not otherwise provided.

2308.4.7 Structural floor sheathing. Structural floor sheathing shall comply with the provisions of Section 2304.7.1.

2308.4.8 Under-floor ventilation. For under-floor ventilation, see Section 1203.3.

2308.4.9 Floor framing supporting *braced wall panels*. When *braced wall panels* are supported by cantilevered floors or are setback from the floor joist support the floor framing shall comply section 2308.6.7.

2308.4.10 Anchorage of exterior means of egress components in *Seismic Design Category D and E*. Exterior egress balconies, exterior exit stairways and similar *means of egress* components in structures assigned to *Seismic Design Category D or E* shall be positively anchored to the primary structure at not over 8 feet (2438 mm) o.c. or shall be designed for lateral forces. Such attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

2308.5 Wall construction. Walls of *conventional light-frame construction* shall be in accordance with this section.

2308.5.1 Stud size, height and spacing. The size, height and spacing of studs shall be in accordance with Table 2308.5.1

Studs shall be continuous from a support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

> **Exception:** Jack studs, trimmer studs and cripple studs at openings in walls that comply with Table 2308.4.1(1) or 2308.4.1(2).

2308.5.2 Framing details. Studs shall be placed with their wide dimension perpendicular to the wall. Not less than three studs shall be installed at each corner of an *exterior wall*.

Exceptions:

1. In interior nonbearing walls and partition, studs are permitted to be set with the long dimension parallel to the wall.

2. At corners, two studs are permitted, provided wood spacers or backup cleats of 3/8-inch-thick (9.5 mm) wood structural panel, 3/8-inch (9.5 mm) Type M “Exterior Glue” particleboard, 1-inch-thick (25 mm) lumber or other *approved* devices that will serve as an adequate backing for the attachment of facing materials are used. Where fire-resistance ratings or shear values are involved, wood spacers, backup cleats or other devices shall not be used unless specifically *approved* for such use.

TABLE 2308.5.1
SIZE, HEIGHT AND SPACING OF WOOD STUDS[c]

STUD SIZE (inches)	BEARING WALLS: Laterally unsupported stud height[a] (feet)	BEARING WALLS: Supporting roof and ceiling only — Spacing (inches)	BEARING WALLS: Supporting one floor, roof and ceiling — Spacing (inches)	BEARING WALLS: Supporting two floors, roof and ceiling — Spacing (inches)	NONBEARING WALLS: Laterally unsupported stud height[a] (feet)	NONBEARING WALLS: Spacing (inches)
2 × 3[b]	NP	NP	NP	NP	10	16
2 × 4	10	24	16	NP	14	24
3 × 4	10	24	24	16	14	24
2 × 5	10	24	24	NP	16	24
2 × 6	10	24	24	16	20	24

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
NP=Not Permitted
a. Listed heights are distances between points of lateral support placed perpendicular to the plane of the wall. Increases in unsupported height are permitted where justified by an analysis.
b. Shall not be used in exterior walls.
c. Utility-grade studs shall not be spaced more than 16 inches (406 mm) o.c., or support more than a roof and ceiling, or exceed 8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior non-load-bearing walls.

2308.5.3 Plates and sills. Studs shall have plates and sills according to this section.

2308.5.3.1. Bottom plate or sill. Studs shall have full bearing on a plate or sill. Plates or sills shall not be less than 2 inches (51 mm) nominal in thickness and have a width at least equal to the width of the wall studs.

2308.5.3.2 Top plates. Studs shall be capped with double top plates installed to provide overlapping at corners and at intersections with other partitions. End joints in double top plates shall be offset at least 48 inches (1219 mm), and shall be nailed in accordance with Table 2304.9.1. Plates shall be a nominal 2 inches (51 mm) in depth and have a width at least equal to the width of the studs.

> **Exception:** A single top plate is permitted, provided the plate is adequately tied at joints, corners and intersecting walls by at least the equivalent of 3-inch by 6-inch (76 mm by 152 mm) by 0.036-inch-thick (0.914 mm) galvanized steel connector that is nailed to each wall or segment of wall by six 8d nails or equivalent, provided the rafters, joists or trusses are centered over the studs with a tolerance of not more than 1 inch (25 mm).

Where bearing studs are spaced at 24-inch (610 mm) intervals and top plates are less than two 2- inch by 6-inch (51 mm by 152 mm) or two 3-inch by 4- inch (76 mm by 102 mm) members and where the floor joists, floor trusses or roof trusses that they support are spaced at more than 16-inch (406 mm) intervals, such joists or trusses shall bear within 5 inches (127 mm) of the studs beneath or a third plate shall be installed.

2308.5.4 Nonbearing walls and partitions. In nonbearing walls and partitions, studs shall be spaced not more than 28 inches (711 mm) o.c. and in interior nonbearing walls and partitions, are permitted to be set with the long dimension parallel to the wall. Interior nonbearing partitions shall be capped with no less than a single top plate installed to provide overlapping at corners and at intersections with other walls and partitions. The plate shall be continuously tied at joints by solid blocking at least 16 inches (406 mm) in length and equal in size to the plate or by 1/2-inch by 1-1/2-inch (12.7 mm by 38 mm) metal ties with spliced sections fastened with two 16d nails on each side of the joint.

2308.5.5 Openings in walls and partitions. Openings in exterior and interior walls and partitions shall comply with sections 2308.5.5.1 through 2308.5.5.3

2308.5.5.1 Openings in exterior bearing walls. Headers shall be provided over each opening in exterior bearing walls. The size and spans in Table 2308.4.1(1) are permitted to be used for one- and two-family *dwellings*. Headers for other buildings shall be designed in accordance with Section 2301.2, Item 1 or 2. Headers shall be of two pieces of nominal 2-inch (51mm) framing lumber set on edge as permitted by Table 2308.4.1(1) and nailed together in accordance with Table 2304.9.1 or of solid lumber of equivalent size.

Wall studs shall support the ends of the header in accordance with Tables 2308.4.1(1). Each end of a lintel or header shall have a bearing length of not less than 1-1/2 inches (38 mm) for the full width of the lintel.

2308.5.5.2 Openings in interior bearing partitions. Headers shall be provided over each opening in interior bearing partitions as required in Section 2308.5.5.1 The spans in Table 2308.4.1(2) are permitted to be used. Wall studs shall support the ends of the header in accordance with Table 2308.4.1(1) or 2308.4.1(2), as appropriate.

2308.5.5.3 Openings in interior nonbearing partitions. Openings in nonbearing partitions are permitted to be framed with single studs and headers. Each end of a lintel or header shall have a bearing length of not less than 11/2 inches (38 mm) for the full width of the lintel.

2308.5.6 Cripple walls. Foundation cripple walls shall be framed of studs not less in size than the studding above with a minimum length of 14 inches (356 mm), or shall be framed of solid blocking. Where exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional *story*. See section 2308.6.5 for cripple wall bracing.

2308.5.7 Bridging. Unless covered by interior or *exterior wall coverings* or sheathing meeting the minimum requirements of this code, stud partitions or walls with studs having a height-to-least-thickness ratio exceeding 50 shall have bridging not less than 2 inches (51 mm) in thickness and of the same width as the studs fitted snugly and nailed thereto to provide adequate lateral support. Bridging shall be placed in every stud cavity and at a frequency such that no stud so braced shall have a height-to-least-thickness ratio exceeding 50 with the height of the stud measured between horizontal framing and bridging or between bridging, whichever is greater.

2308.5.8 Pipes in walls. Stud partitions containing plumbing, heating or other pipes shall be so framed and the joists underneath so spaced as to give proper clearance for the piping. Where a partition containing such piping runs parallel to the floor joists, the joists underneath such partitions shall be doubled and spaced to *permit* the passage of such pipes and shall be bridged. Where plumbing, heating or other pipes are placed in or partly in a partition, necessitating the cutting of the soles or plates, a metal tie not less than 0.058 inch (1.47 mm) (16 galvanized gage) and 11/2 inches (38 mm) wide shall be fastened to each plate across and to each side of the opening with not less than six 16d nails.

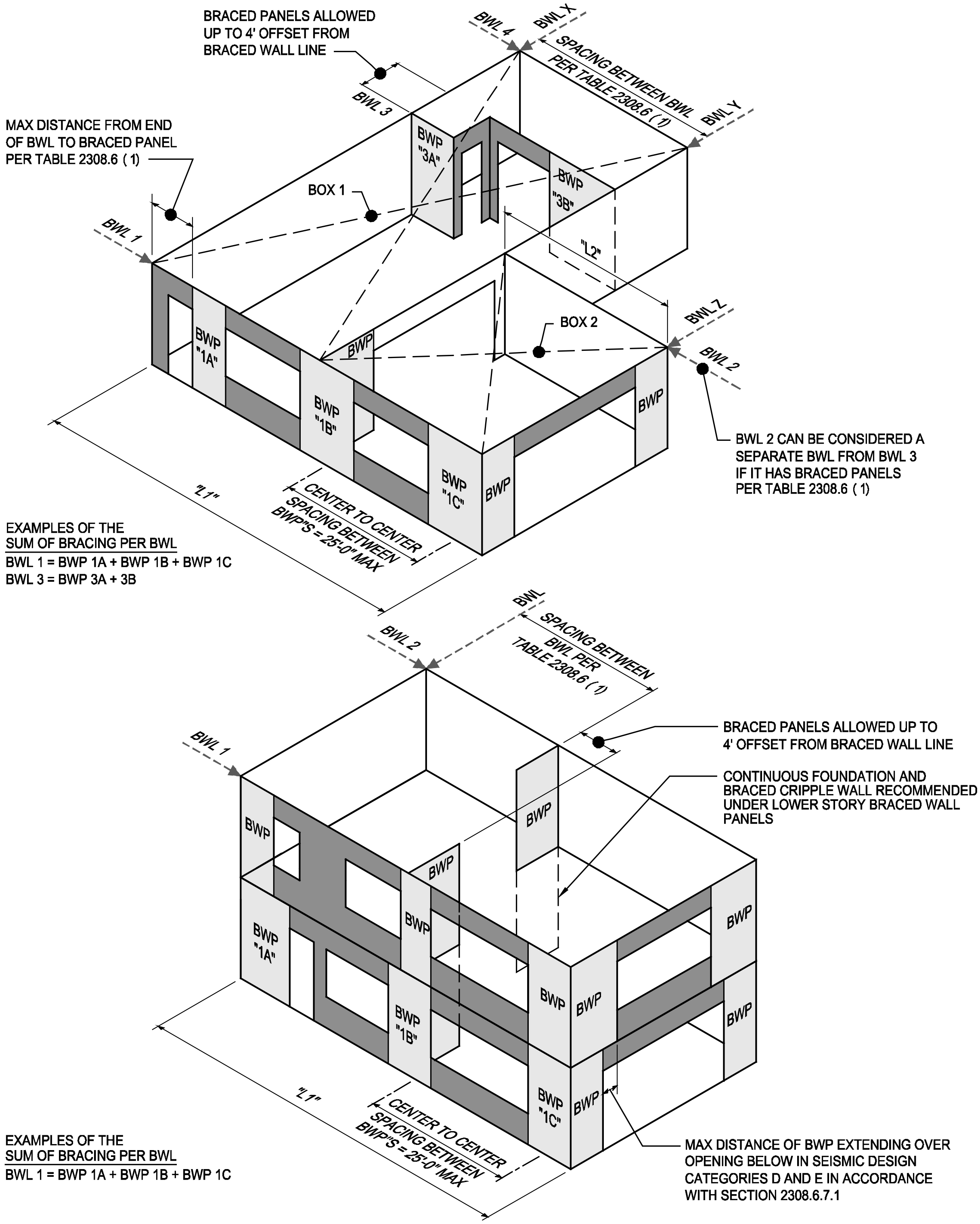
2308.5.9 Cutting and notching. In exterior walls and bearing partitions, any wood stud is permitted to be cut or notched to a depth not exceeding 25 percent of its width. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonbearing partitions supporting no loads other than the weight of the partition.

2308.5.10 Bored holes. A hole not greater in diameter than 40 percent of the stud width is permitted to be bored in any wood stud. Bored holes not greater than 60 percent of the width of the stud are permitted in nonbearing partitions or in any wall where each bored stud is doubled, provided not more than two such successive doubled studs are so bored. In no case shall the edge of the bored hole be nearer than 5/8 inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.

2308.6 Wall Bracing. Buildings shall be provided with exterior and interior braced wall lines as described in Sections 2308.6.1 through 2308.6.9.2.

2308.6.1 *Braced wall lines*. For the purpose of determining the amount and location of bracing required along each story level of a building, *braced wall lines* shall be designated as straight lines through the building plan in both the longitudinal and transverse direction and placed in accordance with Table 2308.6.1 and Figure 2308.6.1. *Braced wall line* spacing shall not exceed the distance specified in Table 2308.6.1. In structures assigned to Seismic Design Category D or E, braced wall lines shall intersect perpendicularly to each other.

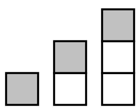
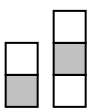
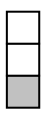
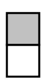
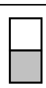
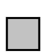
2308.6.2 *Braced wall panels*. *Braced wall panels* shall be placed along *braced wall lines* in accordance with Table 2308.6.1 and Figure 2308.6(1) and specified in Table 2308.6.2(1). A *braced wall panel* must be located at each end of the braced wall line and at the corners of intersecting *braced wall lines* or may begin within the maximum distance from the end of the *braced wall line* in accordance with Table 2308.6(1). *Braced wall panels* in a *braced wall line* shall not be offset from each other by more than 4 feet (1219 mm). Braced wall panels shall be clearly indicated on the plans.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
BWL = BRACED WALL LINE, BWP = BRACED WALL PANEL

Figure 2308.6(1)
BASIC COMPONENTS OF THE LATERAL BRACING SYSTEM

TABLE 2308.1
WALL BRACING REQUIREMENTS

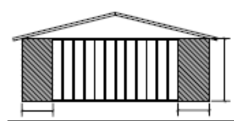
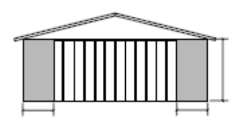
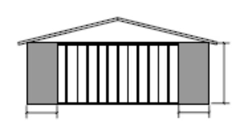
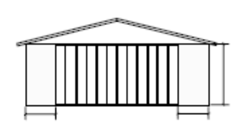
Seismic Design Category	**Story Condition** (See section 2308.2)	**Maximum spacing of braced wall lines**	**Braced panel location, spacing (o.c.) and minimum percentage (x)**			**Maximum distance of braced wall panels from each end of braced wall line**
			Bracing Method			
			LIB	**DWB WSP**	**SFB PBS PCP HPS GB, [c,d]**	
A and B		35'-0"	Each end and ≤25'-0" o.c.	Each end and ≤25'-0" o.c.	Each end and ≤25'-0" o.c.	12'-6"
		35'-0"	Each end and ≤25'-0" o.c.	Each end and ≤25'-0" o.c.	Each end and ≤25'-0" o.c.	12'-6"
		35'-0"	NP	Each end and ≤25'-0" o.c.	Each end and ≤25'-0" o.c.	12'-6"
C		35'-0"	NP	Each end and ≤25'-0" o.c.	Each end and ≤25'-0" o.c.	12'-6"
		35'-0"	NP	Each end and ≤25'-0" o.c. (min 25% of wall length) [e]	Each end and ≤25'-0" o.c. (min 25% of wall length) [e]	12'-6"
D and E		25'-0"	NP	Sds < 0.50: Each end and ≤25'-0" o.c. (min 21% of wall length) [e]	Sds < 0.50: Each end and ≤25'-0" o.c. (min 43% of wall length) [e]	8'-0"
				0.5 ≤ Sds < 0.75: Each end and ≤25'-0" o.c. (min 32% of wall length) [e]	0.5 ≤ Sds < 0.75: Each end and ≤25'-0" o.c. (min 59% of wall length) [e]	
				0.75 ≤Sds ≤ 1.00: Each end and ≤25'-0" o.c. (min 37% of wall length) [e]	0.75 ≤Sds ≤ 1.00: Each end and ≤25'-0" o.c. (min 75% of wall length) [e]	
				Sds > 1.00: Each end and ≤25'-0" o.c. (min 48% of wall length) [e]	Sds > 1.00: Each end and ≤25'-0" o.c. (min 100% of wall length) [e]	

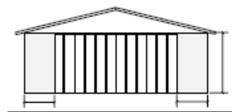
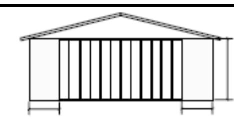
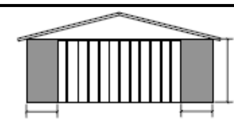
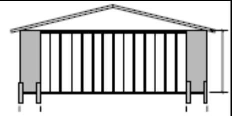
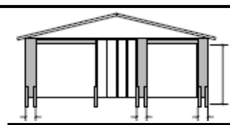
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
NP = Not Permitted

a. This table specifies minimum requirements for *braced wall panels* along interior or exterior *braced wall lines*.
b. See Section 2308.6.2 for full description of bracing methods.
c. Gypsum wallboard applied to framing supports that are spaced at 16 inches on center.
d. The required lengths shall be doubled for gypsum board applied to only one face of a braced wall panel.
e. Percentage shown represents the minimum amount of bracing required along the building length (or wall length if the structure has an irregular shape)

2308.6.3 Braced wall panel methods. Construction of *braced wall panels* shall be by one or a combination of the methods in Table 2308.6.3(1). *Braced wall panel* length shall be in accordance with Section 2308.6.4 or 2308.6.5.

TABLE 2308.6.3(1)
BRACING METHODS

METHODS, MATERIAL	**MINIMUM THICKNESS**	**FIGURE**	**CONNECTION CRITERIA [a]**	
			Fasteners	**Spacing**
LIB [a] Let-in-bracing	1x4 wood or approved metal straps attached at 45° to 60° angles to studs at maximum of 16" o.c.		Per Fastener Table 2304.9.1, item 20 Metal strap: installed per manufacturer's installation recommendations	Wood: per stud plus top and bottom plates Metal strap: installed per manufacturer's installation recommendations
DWB Diagonal wood boards	$^3/_4$" thick (1" nominal) x 6" minimum width to studs at maximum of 24" o.c.		Per Fastener Table 2304.9.1, item 21 or 22	Per stud
WSP Wood structural panel	$^3/_8$" Per TABLE 2308.6.3(2) or 2308.6.3(3)		Per Fastener Table 2304.9.1, item 31	6" edges 12" field
SFB Structural fiberboard sheathing	$^1/_2$" Per TABLE 2308.6.3(4)		Per Fastener Table 2304.9.1, item 33	3" edges 6" field
GB Gypsum board (Double sided)	$^1/_2$" by a minimum of 4 feet wide to studs at maximum of 24" o.c.		Exterior and interior sheathing: with 5d cooler nails (1-5/8" x 0.086") or 1¼" screws (type W or S) for ½" gypsum board or $1^5/_8$" screws (type	For all braced wall panel locations: 7" o.c. along panel edges (including top and bottom plates) and

METHODS, MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA [a]	
			W or S) for 5/8" gypsum board.	7" o.c.in the field
PBS Particle-board sheathing	3/8" or 1/2" per Table 2308.9.3(4) to studs at maximum of 16" o.c.		6d common (2" long x0.113" dia.) nails for 3/8" thick sheathing or 8d common (2½" long x 0.131" dia.) nails for 1/2" thick sheathing	3" edges 6" field
PCP Portland cement plaster	See Section 2510 to studs at maximum of 16" o.c.		1½" long, 11 gage, 7/16" dia. head nails or 7/8" long, 16 gage staples	6" o.c. on all framing members
HPS Hardboard panel siding	7/16" TABLE 2308.6.3(5)		Per Fastener Table 2308.9.1	4" edges 8" field
ABW Alternate braced wall.	3/8"		See Figure 2308.6.5(1) and Section 2308.6.5.1	See Figure 2308.6.3(1)
PFH Portal frame with hold-downs	3/8		See Figure 2308.6.5(2) and Section 2308.6.5.2	See Figure 2308.6.3(2)

For SI: 1 foot 305 mm

a. Method LIB shall have gypsum board fastened to at least one side with nails or screws.

TABLE 2308.6.3(2)

EXPOSED PLYWOOD PANEL SIDING

MINIMUM THICKNESS[a] (inch)	MINIMUM NUMBER OF PLIES	STUD SPACING (inches) Plywood siding applied directly to studs or over sheathing
3/8	3	16[b]
1/2	4	24

For SI: 1 inch = 25.4 mm.

a. Thickness of grooved panels is measured at bottom of grooves.

b. Spans are permitted to be 24 inches if plywood siding applied with face grain perpendicular to studs or over one of the following: (1) 1-inch board sheathing, (2) 7/16-inch wood structural panel sheathing or (3) 3/8-inch wood structural panel sheathing with strength axis (which is the long direction of the panel unless otherwise marked) of sheathing perpendicular to studs.

TABLE 2308.6.3(3)
WOOD STRUCTURAL PANEL WALL SHEATHING[b]
(Not Exposed to the Weather, Strength Axis Parallel or Perpendicular to Studs Except as Indicated Below)

MINIMUM THICKNESS (inch)	PANEL SPAN RATING	STUD SPACING (inches)		
		Siding nailed to studs	Nailable sheathing	
			Sheathing parallel to studs	Sheathing perpendicular to studs
$^3/_8$, $^{15}/_{32}$, $^1/_2$	16/0, 20/0, 24/0, 32/16 Wall—24″ o.c.	24	16	24
$^7/_{16}$, $^{15}/_{32}$, $^1/_2$	24/0, 24/16, 32/16 Wall—24″ o.c.	24	24[a]	24

For SI: 1 inch = 25.4 mm.
a. Plywood shall consist of four or more plies.
b. Blocking of horizontal joints shall not be required except as specified in Sections 2306.3 and 2308.12.4.

TABLE 2308.6.3(4)
ALLOWABLE SPANS FOR PARTICLEBOARD WALL SHEATHING
(Not Exposed to the Weather, Long Dimension of the Panel Parallel or Perpendicular to Studs)

GRADE	THICKNESS (inch)	STUD SPACING (inches)	
		Siding nailed to studs	Sheathing under coverings specified in Section 2308.9.3 parallel or perpendicular to studs
M-S "Exterior Glue" and M-2 "Exterior Glue"	$^3/_8$	16	—
	$^1/_2$	16	16

For SI: 1 inch = 25.4 mm.

TABLE 2308.6.3(5)
HARDBOARD SIDING

SIDING	MINIMUM NOMINAL THICKNESS (inch)	2 × 4 FRAMING MAXIMUM SPACING	NAIL SIZE[a, b, d]	NAIL SPACING	
				General	Bracing panels[c]
1. Lap siding					
Direct to studs	$^3/_8$	16″ o.c.	8d	16″ o.c.	Not applicable
Over sheathing	$^3/_8$	16″ o.c.	10d	16″ o.c.	Not applicable
2. Square edge panel siding					
Direct to studs	$^3/_8$	24″ o.c.	6d	6″ o.c. edges; 12″ o.c. at intermediate supports	4″ o.c. edges; 8″ o.c. at intermediate supports
Over sheathing	$^3/_8$	24″ o.c.	8d	6″ o.c. edges; 12″ o.c. at intermediate supports	4″ o.c. edges; 8″ o.c. at intermediate supports
3. Shiplap edge panel siding					
Direct to studs	$^3/_8$	16″ o.c.	6d	6″ o.c. edges; 12″ o.c. at intermediate supports	4″ o.c. edges; 8″ o.c. at intermediate supports
Over sheathing	$^3/_8$	16″ o.c.	8d	6″ o.c. edges; 12″ o.c. at intermediate supports	4″ o.c. edges; 8″ o.c. at intermediate supports

For SI: 1 inch = 25.4 mm.
a. Nails shall be corrosion resistant.
b. Minimum acceptable nail dimensions:

	Panel Siding (inch)	Lap Siding (inch)
Shank diameter	0.092	0.099
Head diameter	0.225	0.240

c. Where used to comply with Section 2308.9.3.
d. Nail length must accommodate the sheathing and penetrate framing $1^1/_2$ inches.

2308.6.4 Length of *braced wall panels.* For Methods DWB, WSP, SFB, PBS, PCP and HPS each panel must be at least 48 inches (1219 mm) in length, covering three stud spaces where studs are spaced 16 inches (406 mm) apart and covering two stud spaces where studs are spaced 24 inches (610 mm) apart. *Braced wall panels* less than the required 48" length shall not contribute towards the amount of bracing required. *Braced wall panels* longer than the required length shall be credited for their actual length. For Method GB, each panel must be at least 96 inches (2438 mm) in length where applied to one side of the studs or 48 inches (1219 mm) where applied to both sides.

All vertical joints of panel sheathing shall occur over studs and adjacent panel joints shall be nailed to common framing members. Horizontal joints shall occur over blocking or other framing equal in size to the studding except where waived by the installation requirements for the specific sheathing materials. Sole plates shall be nailed to the floor framing in accordance with Section 2308.3.2 and top plates shall be connected to the framing above in accordance with Section 2308.5.3. Where joists are perpendicular to braced wall lines above, blocking shall be provided under and in line with the *braced wall panels.*

2308.6.5 Alternative bracing. An Alternate Braced Wall (ABW) or a Portal Frame with Hold-downs (PFH) described in this section is permitted to substitute for a 48" braced wall panel of methods DWB, WSP, SFB, PBS, PCP or HPS. For method GB, each 96- inch (2438 mm) section (applied to one face) or 48-inch (1219 mm) section (applied to both faces) or portion thereof required by Table 2308.6.1 is permitted to be replaced by one panel constructed in accordance with method ABW or PFH.

2308.6.5.1. Alternate Braced Wall (ABW). An ABW shall be constructed in accordance with this section and Figure 2308.6.5.1. In one-story buildings, each panel shall have a length of not less than 2 feet 8 inches (813 mm) and a height of not more than 10 feet (3048 mm). Each panel shall be sheathed on one face with 3/8- inch-minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Table 2304.9.1 and blocked at wood structural panel edges. Two anchor bolts installed in accordance with Section 2308.3.1 shall be provided in each panel. Anchor bolts shall be placed at each panel outside quarter points. Each panel end stud shall have a hold-down device fastened to the foundation, capable of providing an *approved* uplift capacity of not less than 1,800 pounds (8006 N). The hold-down device shall be installed in accordance with the manufacturer's recommendations. The ABW shall be supported directly on a foundation or on floor framing supported directly on a foundation that is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch by 12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

When the ABW is installed at the first *story* of two-story buildings, the wood structural panel sheathing shall be provided on both faces, three anchor bolts shall be placed at one-quarter points, and tie-down device uplift capacity shall not be less than 3,000 pounds (13 344 N).

2308.6.5.2 Portal Frame with Hold-downs (PFH). A PFH shall be constructed in accordance with this section and Figure 2308.6.5.2. The adjacent door or window opening shall have a full-length header.

In one-story buildings, each panel shall have a length of not less than 16 inches (406 mm) and a height of not more than 10 feet (3048 mm). Each panel shall be sheathed on one face with a single layer of 3/8 inch (9.5 mm) minimum thickness wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Figure 2308.6.5.2. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure 2308.6.5. A built-up header consisting of at least two 2 × 12s and fastened in accordance with Item 24 of Table 2304.9.1 shall be permitted to be used. A spacer, if used, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. The clear span of the header between the inner studs of each panel shall be not less than 6 feet (1829 mm) and not more than 18 feet (5486 mm) in length. A strap with an uplift capacity of not less than 1,000 pounds (4,400 N) shall fasten the header to the inner studs opposite the sheathing. One anchor bolt not less than 5/8 inch (15.9 mm) diameter and installed in accordance with Section 2308.3.1 shall be provided in the center of each sill plate. The studs at each end of the panel shall have a hold-down device fastened to the foundation with an uplift capacity of not less than 4,200 pounds (18 480 N).

Where a panel is located on one side of the opening, the header shall extend between the inside face of the first full-length stud of the panel and the bearing studs at the other end of the opening. A strap with an uplift capacity of not less than 1,000 pounds (4400 N) shall fasten the header to the bearing studs. The bearing studs shall also have a hold-down device fastened to the foundation with an uplift capacity of not less than 1,000 pounds (4400 N). The hold-down devices shall be an embedded strap type, installed in accordance with the manufacturer's recommendations. The PFH panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch by 12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped not less than 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

When a PFH is installed at the first *story* of two-story buildings, each panel shall have a length of not less than 24 inches (610 mm).

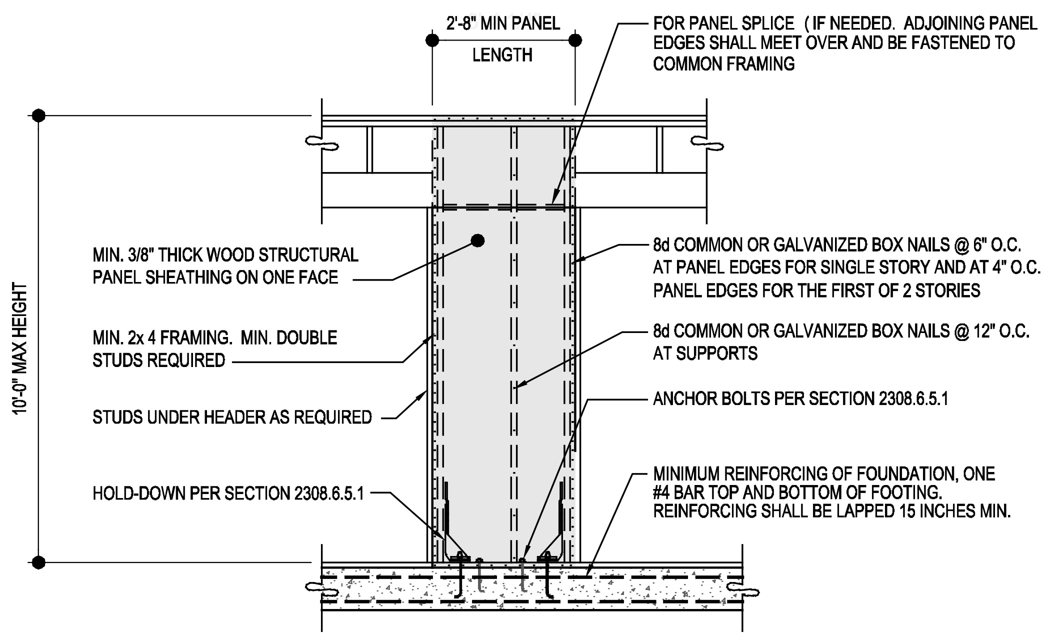


FIGURE 2308.6.5.1
ALTERNATE BRACED WALL PANEL (ABW)

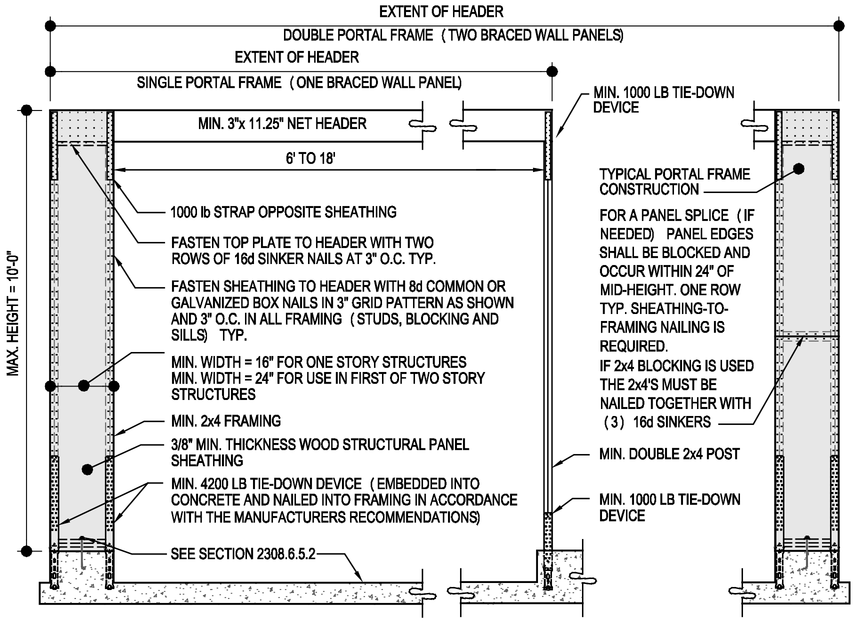


Figure 2308.6.5.2
PORTAL FRAME WITH HOLD-DOWNS (PFH)

2308.6.5 Cripple wall bracing. Cripple walls shall be braced in accordance with the following.

2308.6.5.1 Cripple wall bracing in *Seismic Design Category* A, B and C.. For the purposes of this section, cripple walls having a stud height exceeding 14 inches (356 mm) shall be considered a *story* and shall be braced in accordance with Table 2308.6(1). Spacing of edge nailing for required cripple wall bracing shall not exceed 6 inches (152mm) o.c. along the foundation plate and the top plate of the cripple wall. Nail size, nail spacing for field nailing and more restrictive boundary nailing requirements shall be as required elsewhere in the code for the specific bracing material used.

2308.6.5.2 Cripple wall bracing in *Seismic Design Category* D and E For the purposes of this section, cripple walls having a stud height exceeding 14 inches (356 mm) shall be considered a *story* and shall be braced in accordance with Table 2308.6(1). Where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the lengths required by Table 2308.6(1). Where the cripple wall sheathing type used is method WSP or DWB and this additional length of bracing cannot be provided, the capacity of WSP or DWB sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) o.c.

2308.6.6 Connections of *braced wall panels*. Braced wall panel joints shall occur over studs or blocking. *Braced wall panels* shall be fastened to studs, top and bottom plates and at panel edges. *Braced wall panels* shall be applied to nominal 2-inch-wide [actual 1-1/2 inch (38 mm)] or larger stud framing.

2308.6.6.1 Bottom plate connection. Braced wall line bottom plates shall be connected to joists or full-depth blocking below in accordance with Table 2304.9.1, Item 6, or to foundations in accordance with Section 2308.3.3.

2308.6.6.2 Top plate connection. Where joists and/or rafters are used, braced wall line top plates shall be fastened over the full length of the braced wall line to joists, rafters, rim boards or blocking above in accordance with Table 2304.9.1, as applicable, based on the orientation of the joists or rafters to the braced wall line. Blocking at joists with walls above shall be equal to the depth of the joist at the braced wall line. Blocking at rafters need not be full depth but shall extend to within 2 inches (51 mm) from the roof sheathing above. Blocking shall be a minimum of 2 inches (51 mm) nominal thickness and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11. Notching or drilling of holes in blocking in accordance with the requirements of Section 2308.8.2 or Section 2308.10.4.2 shall be permitted.

At exterior gable end walls braced wall panel sheathing in the top *story* shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15 240 mm).

Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall over the full length of the braced wall line by blocking of the ends of the trusses or by other *approved* methods providing equivalent lateral force transfer. Blocking shall be minimum 2 inches (51 mm) nominal thickness and shall extend to within 2 inches (51 mm) from the roof sheathing above and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1. Notching or drilling of holes in blocking in accordance with the requirements of Section 2308.4.2.4 or Section 2308.7.4 shall be permitted.

2308.6.6.3 Sill anchorage. Where foundations are required by Section 2308.6.7, braced wall line sills shall be anchored to concrete or masonry foundations. Such anchorage shall conform to the requirements of Section 2308.3. The anchors shall be distributed along the length of the braced wall line. Other anchorage devices having equivalent capacity are permitted.

2308.6.6.4 Anchorage to all-wood foundations. Where all-wood foundations are used, the force transfer from the braced wall lines shall be determined based on calculation and shall have a capacity greater than or equal to the connections required by Section 2308.3.

2308.6.7 Braced wall line and diaphragm support. Braced wall lines and floor and roof diaphragms shall be supported in accordance to this section.

2308.6.7.1 Foundation requirements. Braced wall lines shall be supported by continuous foundations.

Exception: For structures with a maximum plan dimension not over 50 feet (15 240 mm), continuous foundations are required at exterior walls only.

For structures in *Seismic Design Category D and E,* exterior *braced wall panels* shall be in the same plane vertically with the foundation or the braced wall line shall be designed in accordance with accepted engineering practice according to section 2308.1.1

Exceptions:

1. Exterior *braced wall panels* may be located up to 4 feet from the foundation below when supported by a floor constructed in accordance with all the following:

   1.1 Cantilevers or setbacks shall not exceed four times the nominal depth of the floor joists
   1.2. Floor joists shall be 2 inches by 10 inches (51 mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) o.c.
   1.3. The ratio of the back span to the cantilever shall be at least 2:1.
   1.4. Floor joists at ends of *braced wall panels* shall be doubled.
   1.5. A continuous rim joist shall be connected to the ends of cantilevered joists. The rim joist is permitted to be spliced using a metal tie not less than 0.058 inch (1.47 mm) (16 galvanized gage) and 11/2 inches (38 mm) wide fastened with six 16d common nails on each side. The metal tie shall have a minimum yield stress of 33,000 psi (227 MPa).

1.6. Joists at setbacks or the end of cantilevered joists shall not carry gravity loads from more than a single *story* having uniform wall and roof loads, nor carry the reactions from headers having a span of 8 feet (2438 mm) or more.

2. The end of a required braced wall panel shall be allowed to extend not more than 1 foot (305 mm) over an opening in the wall below. This requirement is applicable to *braced wall panels* offset in plane and to *braced wall panels* offset out of plane as permitted by the exception to Item 1 above in this section.

   Exception: *Braced wall panels* are permitted to extend over an opening not more than 8 feet (2438 mm) in width where the header is a 4-inch by 12-inch (102 mm by 305 mm) or larger member.

2308.6.7.2 Floor and roof diaphragm support in *Seismic Design Category D and E*. In structures assigned to *Seismic Design Category D or E,* floor and roof diaphragms shall be laterally supported by braced wall lines on all edges and connected in accordance with Section 2308.3.2 [see Figure 2308.6.7.2(1)].

Exception: Portions of roofs or floors that do not support *braced wall panels* above are permitted to extend up to 6 feet (1829 mm) beyond a braced wall line [see Figure 2308.6.7.2(2)] provided that the framing members are connected to the braced wall line below in accordance with Section 2308.6.6.

2308.6.7.3 Stepped footings in Seismic Design Category B, C, D and E . Where the height of a required braced wall panel extending from foundation to floor above varies more than 4 feet (1219 mm), the following construction shall be used:

1. Where the bottom of the footing is stepped and the lowest floor framing rests directly on a sill bolted to the footings, the sill shall be anchored as required in Section 2308.3.3.
2. Where the lowest floor framing rests directly on a sill bolted to a footing not less than 8 feet (2438 mm) in length along a line of bracing, the line shall be considered to be braced. The double plate of the cripple stud wall beyond the segment of footing extending to the lowest framed floor shall be spliced to the sill plate with metal ties, one on each side of the sill and plate. The metal ties shall not be less than 0.058 inch [1.47 mm (16 galvanized gage)] by 11/2 inches (38 mm) wide by 48 inches (1219 mm) with eight 16d common nails on each side of the splice location (see Figure 2308.6.7.3(1). The metal tie shall have a minimum yield stress of 33,000 pounds per square inch (psi) (227 MPa).
3. Where cripple walls occur between the top of the footing and the lowest floor framing, the bracing requirements for a *story* shall apply.

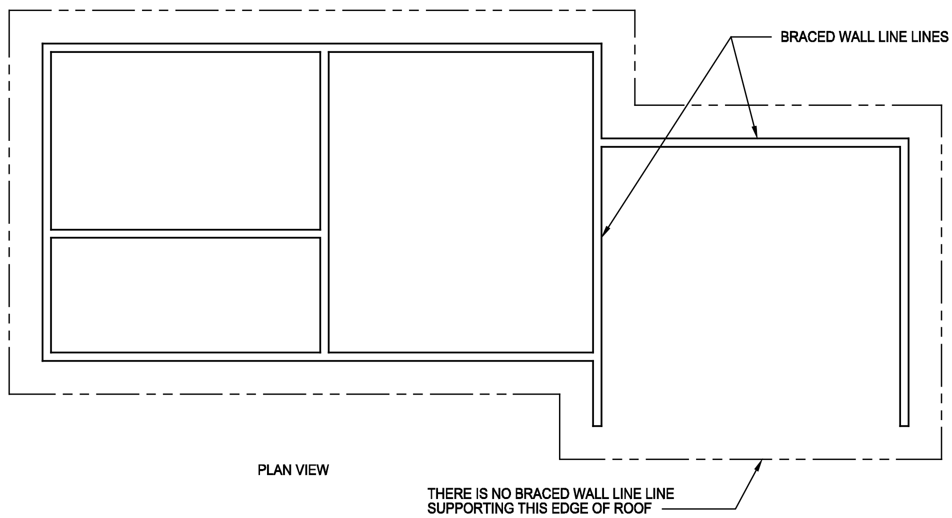


FIGURE 2308.6.7.2(1)
ROOF IN SDC D OR E NOT SUPPORTED ON ALL EDGES

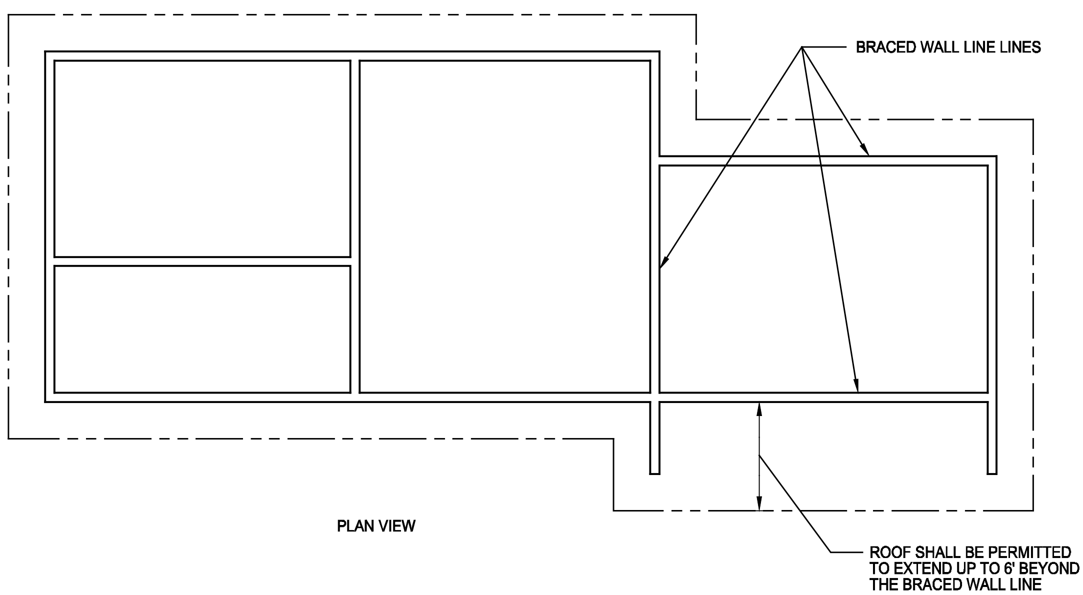
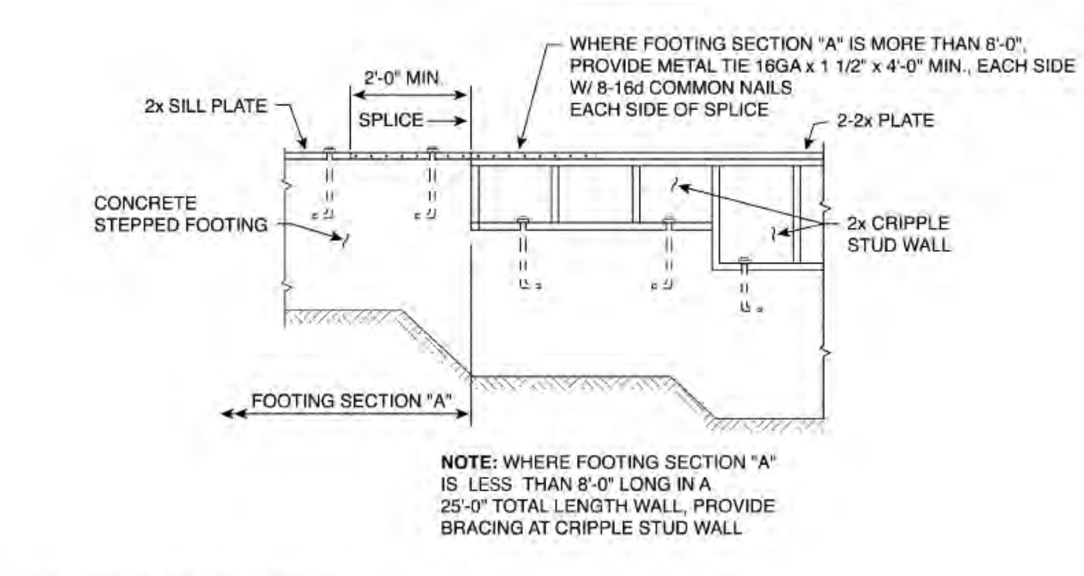


FIGURE 2308.6.7.2(2)
ROOF EXTENSION IN SDC D OR E BEYOND BRACED WALL LINE



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE 2308.6.7.3(1)
STEPPED FOOTING CONNECTION DETAILS

2308.6.8 Attachment of sheathing. Fastening of braced wall panel sheathing shall not be less than that prescribed in Tables 2308.6(1) and 2304.9.1. Wall sheathing shall not be attached to framing members by adhesives.

2308.6.9 Limitations of concrete or masonry veneer. Concrete or masonry veneer shall comply with Chapter 14 and this section.

2308.6.9.1 Limitations of concrete or masonry veneer in *Seismic Design Categories* B or C.. Concrete or masonry walls and stone or masonry veneer shall not extend above a basement.

Exceptions:

1. In structures assigned to *Seismic Design Category* B, stone and masonry veneer is permitted to be used in the first two stories above grade plane or the first three stories above grade plane where the lowest story has concrete or masonry walls, provided that structural use panel wall bracing is used and the length of bracing provided is one and one-half times the required length as determined in Table 2308.9.3(1).
2. Stone and masonry veneer is permitted to be used in the first story above grade plane or the first two stories above grade plane where the lowest story has concrete or masonry walls.
3. Stone and masonry veneer is permitted to be used in both stories of buildings with two stories above grade plane, provided the following criteria are met:
   - 3.1. Type of brace per Section 2308.9.3 shall be WSP and the allowable shear capacity in accordance with Section 2306.3 shall be a minimum of 350 plf (5108 N/m).
   - 3.2. *Braced wall panels* in the second *story* shall be located in accordance with Section 2308.9.3 and not more than 25 feet (7620 mm) on center, and the total length of braced wall panels shall be not less than 25 percent of the braced wall line length. *Braced wall panels* in the first *story* shall be located in accordance with Section 2308.9.3 and not more than 25 feet (7620 mm) on center, and the total length of *braced wall panels* shall be not less than 45 percent of the braced wall line length.
   - 3.3. Hold-down connectors shall be provided at the ends of each *braced wall panel* for the second *story* to first *story* connection with an allowable capacity of 2,000 pounds (8896 N). Hold-down connectors shall be provided at the ends of each *braced wall panel* for the first story to foundation connection with an allowable capacity of 3,900

pounds (17 347 N). In all cases, the hold-down connector force shall be transferred to the foundation.

3.4. Cripple walls shall not be permitted.

2308.6.9.2 Limitations of concrete or masonry in *Seismic Design Categories D and E* Concrete or masonry walls and stone or masonry veneer shall not extend above a basement.

Exception: In structures assigned to *Seismic Design Category* D, stone and masonry veneer is permitted to be used in the first story above grade plane, provided the following criteria are met:

1. Type of brace in accordance with Section 2308.9.3 shall be WSP and the allowable shear capacity in accordance with Section 2306.3 shall be a minimum of 350 plf (5108 N/m).
2. The bracing of the first *story* shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 45 percent of the braced wall line.
3. Hold-down connectors shall be provided at the ends of braced walls for the first floor to foundation with an allowable capacity of 2,100 pounds (9341 N).
4. Cripple walls shall not be permitted.

2308.7 Roof and ceiling framing. The framing details required in this section apply to roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) or greater. Where the roof slope is less than three units vertical in 12 units horizontal (25-percent slope), members supporting rafters and ceiling joists such as ridge board, hips and valleys shall be designed as beams.

2308.7.1 Ceiling joist spans. Allowable spans for ceiling joists shall be in accordance with Table 2308.7.1(1) or 2308.7.1(2). For other grades and species, refer to the *AF&PA Span Tables for Joists and Rafters*.

~~TABLE 2308.10.2(1)~~ TABLE 2308.7.1(1)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable Attics Without Storage, Live Load = 10 pounds psf, L/Δ = 240)

(Portions of Table not shown remain unchanged)

~~TABLE 2308.10.2(2)~~ TABLE 2308.7.1(2)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable Attics With Limited Storage, Live Load = 20 pounds per square foot, L/Δ = 240)

(Portions of Table not shown remain unchanged)

2308.7.2 Rafter spans. Allowable spans for rafters shall be in accordance with Table 2308.7.2(1), 2308.7.2(2), 2308.7.2(3), 2308.7.2(4), 2308.7.2(5) or 2308.7.2(6). For other grades and species, refer to the *AF&PA Span Tables for Joists and Rafters*.

~~TABLE 2308.10.3(1)~~ TABLE 2308.7.2(1)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Roof Live Load = 20 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)

(Portions of Table not shown remain unchanged)

~~TABLE 2308.10.3(2)~~ TABLE 2308.7.2(2)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Roof Live Load = 20 pounds per square foot, Ceiling Attached to Rafters, L/Δ = 240)

(Portions of Table not shown remain unchanged)

~~TABLE 2308.10.3(3)~~ TABLE 2308.7.2(3)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground Snow Load = 30 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)

(Portions of Table not shown remain unchanged)

~~TABLE 2308.10.3(4)~~ TABLE 2308.7.2(4)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground Snow Load = 50 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)

(Portions of Table not shown remain unchanged)

~~TABLE 2308.10.3(5)~~ TABLE 2308.7.2(5)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground Snow Load = 30 pounds per square foot, Ceiling Attached to Rafters, L/Δ = 240)

(Portions of Table not shown remain unchanged)

~~TABLE 2308.10.3(6)~~ TABLE 2308.7.2(6)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Ground Snow Load = 50 pounds per square foot, Ceiling Attached to Rafters, L/Δ = 240)

(Portions of Table not shown remain unchanged)

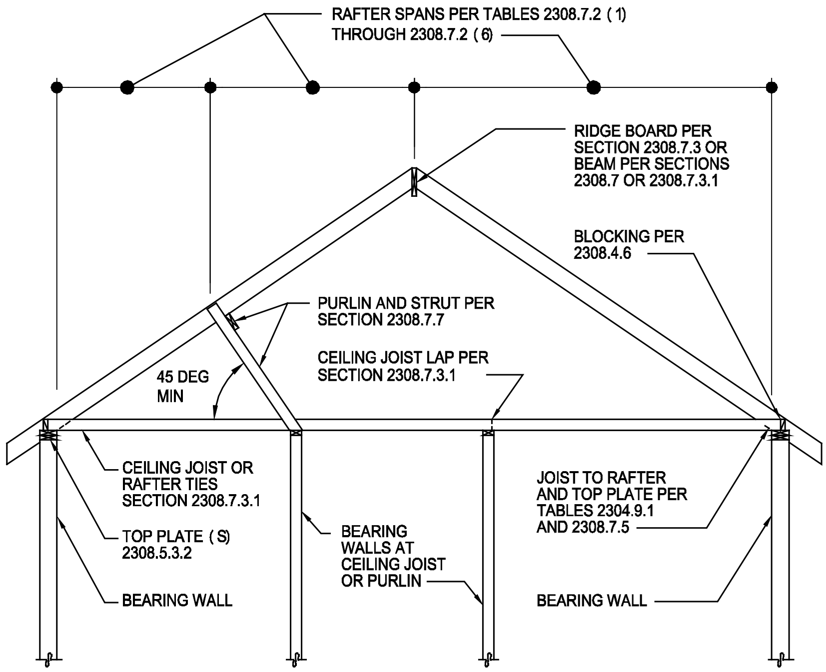
2308.7.3 Ceiling joist and rafter framing. Rafters shall be framed directly opposite each other at the ridge. There shall be a ridge board at least 1-inch (25 mm) nominal thickness at ridges and not less in depth than the cut end of the rafter. At valleys and hips, there shall be a single valley or hip rafter not less than 2-inch (51 mm) nominal thickness and not less in depth than the cut end of the rafter.

2308.7.3.1 Ceiling joist and rafter connections. Ceiling joists and rafters shall be nailed to each other and the assembly shall be nailed to the top wall plate in accordance with Tables 2304.9.1 and 2308.7.5. Ceiling joists shall be continuous or securely joined where they meet over interior partitions and be fastened to adjacent rafters in accordance with Tables 2304.9.1 and 2308.7.3.1 to provide a continuous rafter tie across the building where such joists are parallel to the rafters. Ceiling joists shall have a bearing surface of not less than 1-1/2 inches (38 mm) on the top plate at each end.

Where ceiling joists are not parallel to rafters, an equivalent rafter tie shall be installed in a manner to provide a continuous tie across the building, at a spacing of not more than 4 feet (1219 mm) o.c. The connections shall be in accordance with Tables 2308.7.3.1 and 2304.9.1, or connections of equivalent capacities shall be provided. Where ceiling joists or rafter ties are not provided at the top of the rafter support walls, the ridge formed by these rafters shall also be supported by a girder conforming to Section 2308.2.7. Rafter ties shall be spaced not more than 4 feet (1219 mm) o.c.

Rafter tie connections shall be based on the equivalent rafter spacing in Table 2308.7.3.1. Rafter/ceiling joist connections and rafter/tie connections shall be of sufficient size and number to prevent splitting from nailing.

Roof framing member connection to braced wall lines shall be in accordance with 2308.6.6.2.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 degree = 0.018 rad.
Note: Where ceiling joints run perpendicular to the rafter, rafter ties shall be installed per section 2308.7.3.1

FIGURE 2308.7
ROOF CEILING FRAMING

~~TABLE 2308.10.4.1~~ TABLE 2308.7.3.1
RAFTER TIE CONNECTIONS[g]

(Portions of Table not shown remain unchanged)

2308.7.4 Notches and holes. Notching at the ends of rafters or ceiling joists shall not exceed one-fourth the depth. Notches in the top or bottom of the rafter or ceiling joist shall not exceed one-sixth the depth and shall not be located in the middle one-third of the span, except that a notch not exceeding one-third of the depth is permitted in the top of the rafter or ceiling joist not further from the face of the support than the depth of the member. Holes bored in rafters or ceiling joists shall not be within 2 inches (51 mm) of the top and bottom and their diameter shall not exceed one-third the depth of the member.

2308.7.5 Wind uplift. The roof construction shall have rafter and truss ties to the wall below. Resultant uplift loads shall be transferred to the foundation using a continuous load path. The rafter or truss to wall connection shall comply with Tables 2304.9.1 and 2308.7.5

~~TABLE 2308.10.1~~ TABLE 2308.7.5
REQUIRED RATING OF APPROVED UPLIFT CONNECTORS (pounds)[a, b, c, e, f, g, h]

(Portions of Table not shown remain unchanged)

2308.7.6 Framing around openings. Trimmer and header rafters shall be doubled, or of lumber of equivalent cross section, where the span of the header exceeds 4 feet (1219 mm). The ends of header rafters more than 6 feet (1829 mm) long shall be supported by framing anchors or rafter hangers unless bearing on a beam, partition or wall.

2308.7.6.1 Openings in roof diaphragms in *Seismic Design Categories* B, C, D and E. Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1219 mm) shall be constructed with metal ties and blocking in accordance with this section and Figure 2308.4.4.1(1). Metal ties shall not be less than 0.058 inch [1.47 mm (16 galvanized gage)] thick by 1-1/2 inches (38 mm) wide with a minimum yield stress of 33,000 psi (227 Mpa). Blocking shall be provided 2 feet minimum beyond headers. Ties shall be attached to blocking with eight 16d common nails on each side of the header-joist intersection.

2308.7.7 Purlins. Purlins to support roof loads are permitted to be installed to reduce the span of rafters within allowable limits and shall be supported by struts to bearing walls. The maximum span of 2-inch by 4-inch (51 mm by 102 mm) purlins shall be 4 feet (1219 mm). The maximum span of the 2-inch by 6-inch (51 mm by 152 mm) purlin shall be 6 feet (1829 mm), but in no case shall the purlin be smaller than the supported rafter. Struts shall not be smaller than 2-inch by 4-inch (51 mm by 102 mm) members. The unbraced length of struts shall not exceed 8 feet (2438 mm) and the minimum slope of the struts shall not be less than 45 degrees (0.79 rad) from the horizontal.

2308.7.8 Blocking. Roof rafters and ceiling joists shall be supported laterally to prevent rotation and lateral displacement in accordance with the provisions of Section 2308.8.5 and connected to braced wall lines per Section 2308.6.6.2.

2308.7.9 Engineered wood products. Prefabricated wood I-joists, structural glued-laminated timber and structural composite lumber shall not be notched or drilled except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a *registered design professional*.

2308.7.10 Roof sheathing. Roof sheathing shall be in accordance with Tables 2304.7(3) and 2304.7(5) for wood structural panels, and Tables 2304.7(1) and 2304.7(2) for lumber and shall comply with Section 2304.7.2.

2308.7.11 Joints. Joints in lumber sheathing shall occur over supports unless *approved* end-matched lumber is used, in which case each piece shall bear on at least two supports.

2308.7.12 Roof planking. Planking shall be designed in accordance with the general provisions of this code.

In lieu of such design, 2-inch (51 mm) tongue-and groove planking is permitted in accordance with Table 2308.10.9. Joints in such planking are permitted to be randomly spaced, provided the system is applied to not less than three continuous spans, planks are center matched and end matched or splined, each plank bears on at least one support, and joints are separated by at least 24 inches (610 mm) in adjacent pieces.

2308.7.13 Wood trusses. Wood trusses shall be designed in accordance with Section 2303.4. Connection to braced wall lines shall be in accordance with Section 2308.6.6.2.

2308.7.14 Attic ventilation. For *attic* ventilation, see Section 1203.2.

Reason: This proposal is intended to completely replace the existing section 2308 "Conventional Light-Frame Construction" with a re-formatted version. This proposal is not intended to introduce any new requirements into, nor remove any requirements from, the existing section 2308.

As a result of many code cycles, Section 2308 has become fragmented and is not organized in a logical manner and is difficult to use. With this proposal, Section 2308 is formatted to begin with general requirements then proceed to foundations, floor framing, wall framing, wall bracing and roof-ceiling construction in that order. The additional requirements for *Seismic Design Categories* in the 2012 IBC Sections 2308.11 and 2308.12 (SDC B/C and SDC D/E respectively) have been merged into the appropriate new sections based on the type of construction such as floor framing, wall bracing and roof framing.

Terminology has been coordinated throughout the section such as the terms, "conventional light-frame construction", "braced wall line" and "braced wall panel".

This proposal is intended to be non-technical and separate proposals have been submitted to address technical items in section 2308.

In order to make the prescriptive provisions of the IBC more closely resemble the format of the similar provisions in the IRC, much of the wall bracing terminology is replicated from the IRC, namely:

- The requirements for braced wall line spacing were put into a single table format based on Seismic Design Category rather than scattered throughout all of Section 2308.
- The wall bracing methods were compiled into a table similar to the IRC, including abbreviations for the methods, rather

than referring to them by a number. The fasteners specified in this table were cross-referenced to the fastener table 2308.9.3.1 where applicable.

- For the section, “Alternate bracing” a figure (copied from the IRC) was introduced, but no technical changes were made.
- Similarly, for Section 2308.9.3.2, “Alternate bracing wall panel adjacent to a door or window opening” was renamed since it aligned perfectly with the Portal Frame with Hold-downs method (PFH) in the IRC. The figure was already in the IBC, so the title was changed to reflect the new name.

Comparison of the proposed 2015 to the existing 2012

<table>
<tr><th>Proposed 2015</th><th>2012 IBC</th></tr>
<tr><td>2308 Conventional Light-Frame Construction</td><td>2308 Conventional Light-Frame Construction</td></tr>
<tr><td>2308.1 General. The requirements of this section are intended for conventional light-frame construction. Other construction methods are permitted to be used, provided a satisfactory design is submitted showing compliance with other provisions of this code. Interior non-load-bearing partitions, ceilings and curtain walls of conventional light-frame construction are not subject to the limitations of ~~this~~ section 2308.2.</td><td>2308.1 General. As shown modified to the left</td></tr>
<tr><td></td><td>2308.1.1 Portions exceeding limitations of conventional construction. Moved to 2308.2.8</td></tr>
<tr><td>2308.2 Limitations</td><td>2308.2 Limitations. Included reference to items in 2308.11 (SDC B and C) and 2308.12 (SDC D and E). Those items have been moved here and elsewhere in the section as noted.</td></tr>
<tr><td>2308.2.1 Stories. The height limitations in the table are from:

2308.2.1 Stories. Structures of conventional light-frame construction shall be limited in story height according to the following:
<table>
<tr><th>Seismic Design Category</th><th>Allowable Story above grade plane</th></tr>
<tr><td>A and B</td><td>Three stories</td></tr>
<tr><td>C</td><td>Two Stories</td></tr>
<tr><td>D and E [a]</td><td>One story</td></tr>
</table>
a. For the purposes of this section, for buildings assigned to Seismic Design Category D or E, unless cripple walls are solid blocked and do not exceed 14 inches in height, cripple walls shall be considered to be a story.</td><td>2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of conventional light-frame construction, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.
1. Buildings shall be limited to a maximum of three stories above grade plane. For the purposes of this section, for buildings assigned to Seismic Design Category D or E, cripple stud walls shall be considered to be a story.
Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a story.

2308.11.1 Number of stories. Structures of conventional light-frame construction and assigned to Seismic Design Category C shall not exceed two stories above grade plane.

2308.12.1 Number of stories. Structures of conventional light-frame construction and assigned to Seismic Design Category D or E shall not exceed one story above grade plane.</td></tr>
<tr><td>2308.2.2 Allowable floor-to-floor height</td><td>Moved from 2308.2, item 2</td></tr>
<tr><td>2308.2.3 Allowable Loads</td><td>Moved from 2308.2, item 3</td></tr>
<tr><td>2308.2.4 Allowable wind speed</td><td>Moved from 2308.2, item 4</td></tr>
<tr><td>2308,2,5 Allowable roof span</td><td>Moved from 2308.2, item 5</td></tr>
<tr><td>2308.2.6 Risk Category limitation</td><td>Moved from 2308.2, item 6. SDC “F” was deleted since the provisions of 2308 are not allowed in SDC F.</td></tr>
<tr><td>2308.2.8 Portions exceeding limitations of conventional light-frame construction</td><td>Moved from 2308.1.1 and unchanged. The last sentence was moved here from the last sentence of 2308.4.2. The rest of 2308.4.2 was redundant.</td></tr>
<tr><td>2308.3 Foundations and footings. Foundations and footings shall be as specified in Chapter 18.</td><td>Moved from 2308.6</td></tr>
<tr><td>2308.3.1 Foundation plates or sills</td><td>Moved from 2308.12.9</td></tr>
<tr><td>2308.3.2 Sill plate anchorage in Seismic Design Category D and E.</td><td>2308.12.8 Sill plate anchorage</td></tr>
<tr><td>2308.4 Floor framing</td><td></td></tr>
<tr><td>2308.4.1 Girders</td><td>Moved from 2308.7</td></tr>
<tr><td>2308.4.2 Floor joists</td><td></td></tr>
<tr><td>2308.4.2.1 Span</td><td>Moved from 2308.8</td></tr>
</table>

2308.4.2.2 Bearing	Moved from 2308.8.1. Switched first sentence to end of paragraph
2308.4.2.3 Framing details	Moved from 2308.8.2. Notches portion removed and placed in section 2308.4.2.4
2308.4.2.4 Notches and holes	Moved from 2308.8.2
2308.4.3 Engineered wood products	Moved from 2308.8.2.1. First sentence is new.
2308.4.4 Framing around openings	Moved from 2308.8.3
2308.4.4.1 Openings in horizontal diaphragms in SDC B, C, D and E	From 2308.11.3.3 The text of this section has been re-arranged for clarity. The first sentence states that a tie and blocking are required. Then, the tie is described followed by the blocking.
2308.4.5 Joists supporting bearing partitions	Moved from 2308.8.4
2308.4.6 Lateral support	Moved from 2308.8.5. Changed "Floor, attic and roof…." to "Floor and ceiling…"
2308.4.7 Structural floor sheathing	Moved from 2308.8.6
2308.4.8 Under-floor ventilation	Moved from 2308.8.7
2308.4.9 Floor framing supporting braced wall panels	Reference to existing requirements from 2308.12.6 that have been moved to 2308.6.7
2308.4.10 Anchorage of exterior means of egress components in Seismic Design Category D or E	Moved from 2308.12.7
2308.5 Wall Construction	
2308.5.1 Stud size, height and spacing	Moved from 2308.9.1.
2308.5.2 Framing details	Moved from 2308.9.2 Exception #1 from 2308.9.2.3 Exception #2 from 2308.9.2
Table 2308.5.1	From existing Table 2308.9.1 Footnote "c" is from existing language in section 2308.9.1
2308.5.3 Plates and sills	
2308.5.3.1 Bottom plate or sill	From 2308.9.2.4
2308.5.3.2 Top plates	From 2308.9.2.1
2308.5.4 Nonbearing walls and partitions	From 2308.9.2.3
2308.5.5 Openings in walls and partitions	From 2308.9.5.
2308.5.5.1 Openings in exterior bearing walls "Wall studs shall support……"	From 2308.9.5.1 From 2308.9.5.2
2308.5.5.2 Openings in interior bearing partitions	From 2308.9.6
2308.5.5.2 Openings in interior nonbearing partitions	From 2308.9.7.
2308.5.6 Cripple walls	From 2308.9.4
2308.5.7 Bridging	From 2308.9.9
2308.5.8 Pipes in walls	From 2308.9.8
2308.5.9 Cutting and notching	From 2308.9.10
2308.5.10 Bored holes	From 2308.9.11
2308.6 Wall bracing	
2308.6.1 Braced wall line spacing Refers to new Table 2308.6.1 that contains spacing information from:	 BWL at 35' o.c. from 2308.3.1 BWL in SDC D/E at 25' o.c. from 2308.12.3
2308.6.2 Location of braced panels	From 2308.9.3. Distance of panel from end of wall line (12 ½ feet) was moved to Table 2308.6.1 along with SDC D and E limitation of 8 feet from 2308.12.4
2308.6.3 Braced wall panel methods New Table 2308.6.3(1)	From 2308.9.3. items 1 through 8 are re-located into Table 2308.6.3.(1) and renamed;

	1 LIB Let In Bracing 2 DWB Diagonal Wood Boards 3 WSP Wood Structural Panels 4 SFB Structural Fiberboard Sheathing 5 GB Gypsum Board 6 PBS Particle Board Sheathing 7 PCP Portland Cement Plaster 8 HPS Hardboard Panel Siding The two "Alternative bracing" options from 2308.9.3.1 are incorporated into Table 2308.6.3(1) as items 9 and 10 9 Alt bracing from 2308.9.3.1 ABW (Alternate Braced Wall) 10 Alt bracing wall panel adjacent to a door or window opening PFH (Portal Frame w/ Hold-downs)
2308.6.4 Length of braced wall panels	From 2308.9.3
2308.6.5 Alternative bracing	From 2308.9.3.1
2308.6.5.1 Alternate Braced Wall (ABW)	From 2308.9.3.1
2308.6.5.2 Portal Frame w/ Hold-downs (PFH)	From 2308.9.3.2 "Alternate bracing wall panel adjacent to a door or window opening"
2308.6.6 Cripple wall bracing	From 2308.9.4.1
2308.6.6.1 Cripple wall bracing in Seismic Design Category A, B and C	From 2308.9.4.1 and 2308.9.4.2
2308.6.6.2 Cripple wall bracing in Seismic Design Category D and E	From 2308.12.4
2308.6.7 Connections of braced wall panels	From 2308.12.4
2308.6.6.1 Bottom plate connection	From 2308.3.2.1
2308.6.6.2 Top plate connection	From 2308.3.2.2
2308.6.6.3 Sill anchorage	From first portion of 2308.3.3. The remainder of 2308.3.3 is moved to 2308.3.1 "Foundation Plates and Sills"
2308.6.6.4 Anchorage to all-wood foundations	From 2308.3.3.1
2308.6.7 Braced wall line support	
2308.6.7.1 Foundation requirements Cantilever floor provisions Braced panel over beam below	From 2308.3.4 From 2308.12.6, Item 1 (re-worded) From 2308.12.6, Item 3 (re-worded and shown in Fig. 2308.6(1)
2308.6.7.2 Floor and roof diaphragm support in Seismic Design Category D and E	From 2308.12.6, item 2
2308.6.7.3 Stepped footings in SDC B,C,D and E	From 2308.11.3.2
2308.6.8 Attachment of sheathing	From 2308.12.5
2308.6.9 Limitation of concrete or masonry veneer	
2308.6.9.1 Concrete or masonry veneer in Seismic Design Category B and C	From 2308.11.2
2308.6.9.2 Concrete or masonry veneer in Seismic Design Category D and E	From 2308.12.2
2308.7 Roof and ceiling framing	From 2308.10. Figure 2308.7 is new and is similar to the Figure in the IRC
2308.7.1 Ceiling joist spans	From 2308.10.2
2308.7.2 Rafter spans	From 2308.10.3
2308.7.3 Ceiling joist and rafter framing	From 2308.10.4
2308.7.3 Ceiling joist and rafter connections	From 2308.10.4
2308.7.4 Notches and holes	From 2308.10.4.2
2308.7.5 Wind uplift	From 2308.10.1
2308.7.6 Framing around openings	From 2308.10.4.3

2308.7.6 Openings in roof diaphragms in SDC B, C, D and E	From 2308.11.3.3 The text of this section has been re-arranged for clarity. The first sentence states that a tie and blocking are required. Then, the tie is described followed by the blocking.
2308.7.7 Purlins	From 2308.10.5
2308.7.9 Engineered wood products	From 2308.10.7
2308.7.10 Roof sheathing	From 2308.10.8
2308.7.11 Joints	From 2308.10.8.1
2308.7.12 Roof planking	From 2308.10.9
2308.7.13 Trusses	From 2308.10.10
2308.7.14 Attic ventilation	From 2308.10.11

Cost Impact: The code change proposal will not increase the cost of construction.

S273-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308-S-RICE.doc

S274–12
2308.2.1

Proponent: Philip Line, American Wood Council

Revise as follows:

2308.2.1 Nominal design wind speed greater than ~~100~~ 130 mph (3-second gust). Where ~~V_{asd} as determined in accordance with Section 1609.3.1~~ V_{ult} exceeds ~~100~~ 130 mph (3-second gust), the provisions of either AF&PA WFCM, or the ICC 600 are permitted to be used. Wind speeds in Figures 1609A, 1609B, and 1609C shall be converted to V_{asd} wind speed in accordance with Section 1609.3.1 for use with ~~AF&PA WFCM or~~ ICC 600.

Reason: ASD wind speeds, V_{asd}, are converted to V_{ult} wind speeds to work directly with V_{ult} wind speed maps in the IBC (Figure 1609A, Figure 1609B, and Figure 1609C). For 2012 WFCM, the conversion to V_{asd} is not applicable as the updated AWC's 2012 WFCM utilizes V_{ult} wind speeds. Text is added to clarify application of 1609.3.1 for determination of V_{asd} wind speeds for use with ICC 600.

Cost Impact: The code change proposal will not increase the cost of construction.

S274-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.2.1-S-LINE.doc

S275–12
2308.2.1

Proponent: Randall Shackelford, P.E., Simpson Strong-Tie Company, Inc. (rshackelford@strongtie.com)

Revise as follows:

2308.2.1 Nominal design wind speed greater than 100 mph (3-second gust). Where V_{asd} as determined in accordance with Section 1609.3.1 exceeds 100 mph (3-second gust), the provisions of either AF&PA WFCM, or the ICC 600 are permitted to be used. ~~Wind speeds in Figures 1609A, 1609B, and 1609C shall be converted in accordance with Section 1609.3.1 for use with AF&PA WFCM or ICC 600.~~

Reason: The 2012 WFCM, as referenced in Chapter 35 of the 2012 IBC, is based on Ultimate Wind Speeds, V_{ult}, and therefore does not require conversion of the ultimate wind speed to the nominal wind speed, V_{asd}.
Further, the WFCM is the reference standard for wood framing in the ICC-600, so conversion should not take place when using ICC-600 to design wood framing. A committee has been appointed to revise ICC-600, and this code change is written assuming that the basis of ICC-600 will be changed to V_{ult} wind speeds, with conversion factors in the standard for converting to V_{asd} where needed. If by the Public Comment deadline it is not clear that this will be the case, I will prepare a Public Comment to restore Exception 1 to the list of items where conversion is required.

If this code change is not approved, structures designed using the 2012 WFCM with converted wind speeds will be designed for wind speeds that are only 60% of the pressures they should be designed for.

Cost Impact: The code change proposal will not increase the cost of construction.

S275-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.2.1-S-SHACKELFORD.doc

S276–12
2308.2

Proponent: Charles S. Bajnai, Chesterfield County (bajnaic@chesterfield.gov), VA, Ed Keith, American Plywood Association, representing Chesterfield County, VA, Robert Rice, OBOA, representing Chesterfield County, VA

Revise as follows:

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of *conventional light-frame construction*, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

3.1. Average dead loads shall not exceed 15 psf (718 N/m2) for combined roof and ceiling, exterior walls, floors and partitions.

Exceptions:

1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m^2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code. 3.2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors.

3.2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors <u>of conventional light-frame construction</u>.

3.3. Ground snow loads shall not exceed 50 psf (2395 N/m^2).

(Portions of text not shown remain unchanged)

Reason: The limitation of 40 psf live load for floors from Table 1607.1 makes Section 2308, Conventional Light- Frame Construction, essentially restricted to residential construction.

This code change proposal is intended to clarify that the 40 psf live load for floors applies to all stories constructed of conventional light-frame construction.

This new exemption would allow Section 2308, Conventional Light-Frame Construction to apply to live/work structures, and one story offices, retail spaces, assembly spaces, schools, etc

Cost Impact: The code change proposal will not increase the cost of construction.

S276-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.2-BAJNAI-RICE.doc

S277–12
2308.2

Proponent: Philip Line, American Wood Council

Revise as follows:

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of *conventional light-frame construction*, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three *stories above grade plane*. For the purposes of this section, for buildings assigned to *Seismic Design Category* D or E, cripple stud walls shall be considered to be a *story*.

   Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a *story*.

2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm). Bearing wall height shall not exceed a stud height of 10 feet (3048 mm).
3. Loads as determined in Chapter 16 shall not exceed the following:
   3.1. Average dead loads shall not exceed 15 psf (718 N/m^2) for combined roof and ceiling, exterior walls, floors and partitions.

   Exceptions:

   1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m^2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
   2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.

   3.2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors.
   3.3. Ground snow loads shall not exceed 50 psf (2395 N/m^2).

4. ~~V_{asd} as determined in accordance with Section 1609.3.1~~ <u>V_{ult}</u> shall not exceed ~~100~~ <u>130</u> miles per hour (mph) (~~44~~ <u>57.2</u> m/s) (3- second gust).

   Exception: ~~V_{asd} as determined in accordance with Section 1609.3.1~~ <u>V_{ult}</u> shall not exceed ~~110~~ <u>140</u> mph (~~48.4~~ <u>61.6</u> m/s) (3-second gust) for buildings in Exposure Category B that are not located in a *hurricane-prone region*.

5. Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.
6. The use of the provisions for *conventional light-frame construction* in this section shall not be permitted for *Risk Category* IV buildings assigned to *Seismic Design Category* B, C, D, E or F.
7. *Conventional light-frame construction* is limited in irregular structures assigned to *Seismic Design Category* D or E, as specified in Section 2308.12.6.

Reason: ASD wind speeds, V_{asd}, are converted to V_{ult} wind speeds to work directly with V_{ult} wind speed maps in the IBC (Figure 1609A, Figure 1609B, and Figure 1609C). This change will allow direct comparison of the wind speed limits in 2308.2 Item 4 with IBC wind speed maps for determination of applicability of provisions in 2308 eliminating potential error due to mathematical conversion of V_{asd} to V_{ult}. Use of V_{ult} also better coordinates with the V_{ult} wind speed of 115 mph defined in Chapter 2 for hurricane prone region. Additionally, this change will allow better coordination with V_{ult} basis of WFCM wind design provisions and strength design basis ASCE 7-10 wind load provisions.

The value of 130 mph comes from the solving Equation 16-33 for V_{ult} and rounding as follows:
$V_{ult} = (V_{asd})/(0.6\hat{}0.5)$
V_{ult} = (100 mph)/(0.6^0.5) = 129.099 mph
V_{ult} = 130 mph

The value of 140 mph comes from solving Equation 16-33 for V_{ult} and rounding as follows:
$V_{ult} = (V_{asd})/(0.6\hat{}0.5)$
V_{ult} = (110 mph)/(0.6^0.5) = 142.009 mph
V_{ult} = 140 mph

With the exception of rounding to facilitate use of mapped wind speed contours, this change does not introduce technical change to existing wind speed limitations. Rounding up to 130 mph affects locations with V_{ult} wind speed between 129 mph and 130 mph such that provisions of 2308 are now applicable in those locations. Rounding down to 140 mph affects locations with V_{ult} wind speed between 140 mph and 142 mph such that provisions of 2308 are no longer applicable in those locations.

Cost Impact: The code change proposal will not increase the cost of construction.

S277-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.2-S-LINE.doc

S278–12
2308.2

Proponent: Robert Rice, Josephine County, OR, representing Oregon Building Officials Association (structdesigner@yahoo.com)

Revise as follows:

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of *conventional light-frame construction*, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three *stories above grade plane*. For the purposes of this section, for buildings assigned to *Seismic Design Category* D or E, cripple stud walls shall be considered to be a *story*.

   Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a *story*.

2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm). Bearing wall height shall not exceed a stud height of 10 feet (3048 mm).
3. Loads as determined in Chapter 16 shall not exceed the following:
   3.1. Average dead loads shall not exceed 15 psf (718 N/m^2) for combined roof and ceiling, exterior walls, floors and partitions.

   Exceptions:

   1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m^2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
   2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.

   3.2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors.
   3.3. Ground snow loads shall not exceed 50 psf (2395 N/m^2).
4. V_{asd} as determined in accordance with Section 1609.3.1 shall not exceed 100 miles per hour (mph) (44 m/s) (3- second gust).

   Exception: V_{asd} as determined in accordance with Section 1609.3.1 shall not exceed 110 mph (48.4 m/ s) (3-second gust) for buildings in Exposure Category B that are not located in a *hurricane-prone region*.

5. ~~Roof trusses and~~ <u>Ceiling joist and</u> rafters <u>framing constructed in accordance with Section 2308.10 and trusses</u> shall not span more than 40 feet (12 192 mm) between points of vertical support. <u>A ridge board in accordance with Section 2308.10 or 2308.10.4.1 shall not be considered a vertical support.</u>
6. The use of the provisions for *conventional light-frame construction* in this section shall not be permitted for *Risk Category* IV buildings assigned to *Seismic Design Category* B, C, D, E or F.
7. *Conventional light-frame construction* is limited in irregular structures assigned to *Seismic Design Category* D or E, as specified in Section 2308.12.6.

Reason: This proposal clarifies the requirements of the existing code language. The provisions of the existing code defining the construction of roof/ceiling assemblies with *conventional light-frame construction* are predicated on the fact that a "ridge-board" does not provide “vertical support”. According to the commentary, the current code limitation of *“Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.”* is intended to limit the use the rafter/ceiling joist (or rafter tie) provisions of *“Conventional light-frame construction”.*

The commentary states:

“In buildings with roof framing spans in excess of 40 feet (12192 mm), the horizontal thrust of that framing on the top plate on which it rests is greater than can be resisted by the ceiling joist and rafter connections specified in Section 2308.10.4.1. Note that the limitation is on the span of the truss or rafter and not on the width of the building. The building width could exceed 40 feet (12192 mm) as long as the actual span of the roof framing is no more than 40 feet (12192 mm).”

The commentary correctly identifies that there are “horizontal thrust” forces in a rafter/ceiling joist assembly. Those forces are addressed in Section 2308.10.4.1 where it states, *“Ceiling joists shall be continuous or securely joined where they meet over interior partitions and fastened to adjacent rafters in accordance with* ***Tables 2308.10.4.1*** *and 2304.9.1 to provide a continuous rafter tie across the building where such joists are parallel to the rafters.”* Table 2308.10.4.1 contains the necessary rafter tie connections based on rafter slope, snow load and roof span. The roof span, per the table, is up to 36 feet. In addition, footnote “c” of Table 2308.10.4.1 further verifies this with the statement that, *“Rafter tie heel joint connections are not required where the ridge is supported by a load-bearing wall, header or ridge beam.”* An error exists in the statement of the commentary in that trusses do not impose the “horizontal thrust” on the top plate of the wall like rafter/ceiling joist framing does. The horizontal forces of a truss at it’s bearing points are non-existent, or negligible, due to the fact that the forces are resolved within the chords and web members of the truss and only vertical loads exist at it’s bearing points such as on the exterior walls.

However, a second concern exists and is a factor in limiting the roof span to 40 feet. The bearing wall studs in Table 2308.9.1 are limited in their capacity to resist buckling due to the vertical (axial) forces and the unbraced length of the studs. When considering the load limitations of 2308.2 item 3.1, 15 psf dead load, and item 3.3, snow load of 50 psf, the combined roof load could be 65 psf. A 40 foot span would result in a load of 65 x 40/2 = 1300 plf to the top plates. With studs at 16 inch o.c. the load/stud = 1300 x (16/12) = 1733#/stud.

Therefore, the purpose of this proposal is to clarify that a non-vertically-supporting “ridge board” is not to be considered a “vertical support”. If it were to be mistakenly considered to be a support, the tributary roof load would far exceed that capacity of the studs as well as the limitations of the values in the rafter tie table. This clarification will not effect the requirements for wall bracing and the location, or spacing, of braced wall lines. Currently, braced wall lines are required at 35 feet o.c. in each direction in *Seismic Design Category* A, B and C and 25 feet o.c. in each direction in *Seismic Design Category* D and E.

For reference, sections 2308.10 and 2308.10.4.1 state:

2308.10 Roof and ceiling framing. *The framing details required in this section apply to roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) or greater.* ***Where the roof slope is less than three units vertical in 12 units horizontal (25-percent slope), members supporting rafters and ceiling joists such as ridge board, hips and valleys shall be designed as beams.***

2308.10.4.1 Ceiling joist and rafter connections. *Ceiling joists and rafters shall be nailed to each other and the assembly shall be nailed to the top wall plate in accordance with Tables 2304.9.1 and 2308.10.1. Ceiling joists shall be continuous or securely joined where they meet over interior partitions and fastened to adjacent rafters in accordance with Tables 2308.10.4.1 and 2304.9.1 to provide a continuous rafter tie across the building where such joists are parallel to the rafters. Ceiling joists shall have a bearing surface of not less than 11/2 inches (38 mm) on the top plate at each end. Where ceiling joists are not parallel to rafters, an equivalent rafter tie shall be installed in a manner to provide a continuous tie across the building, at a spacing of not more than 4 feet (1219 mm) o.c. The connections shall be in accordance with Tables 2308.10.4.1 and 2304.9.1, or connections of equivalent capacities shall be provided.* ***Where ceiling joists or rafter ties are not provided at the top of the rafter support walls, the ridge formed by these rafters shall also be supported by a girder conforming to Section 2308.4.***

Cost Impact: The code change proposal will not increase the cost of construction. This proposal does not add any new requirement or limitation to the code. It is intended to clarify the code for consistency in application.

S278-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.2-S-RICE.doc

S279–12
2308.3.2.2

Proponent: Robert Rice, C.B.O, Josephine County, OR, representing Oregon Building Officials Association (structdesigner@yahoo.com), R. Terry Malone, P.E., S.E., representing self

Revise as follows:

2308.3.2.2 Top plate connection. Where joists and/or rafters are used, braced wall line top plates shall be fastened over the full length of the braced wall line to joists, rafters, rimboards or <u>full-depth</u> blocking above in accordance with Table 2304.9.1, Items 11, 12, 15 or 19, as applicable, based on the orientation of the joists or rafters to the braced wall line. ~~Blocking at joists with walls above shall be equal to the depth of the joist at the braced wall line. Blocking at rafters need not be full depth but shall extend to within 2 inches (51 mm) from the roof sheathing above.~~ Blocking shall be a minimum of 2 inches (51 mm) nominal thickness and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11. Notching or drilling of holes in blocking in accordance with the requirements of Section 2308.8.2 or Section 2308.10.4.2 shall be permitted.

At exterior gable end walls braced wall panel sheathing in the top *story* shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15 240 mm).

Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall over the full length of the braced wall line by blocking of the ends of the trusses or by other *approved* methods providing equivalent lateral force transfer. Blocking shall be minimum 2 inch (51 mm) nominal thickness and ~~shall extend to within 2 inches (51 mm) from the roof sheathing above~~ <u>equal to the depth of the truss at the wall line</u> and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11. Notching or drilling of holes in blocking in accordance with the requirements of Section 2308.8.2 or Section 2308.10.4.2 shall be permitted.

Reason: In the last code cycle for the development of the 2012 code, section 2308.3.2 was modified. The proposal (S211) re-arranged the section into bottom plate connections (2308.3.2.1) and top plate connections (2308.3.2.2). Another proposal was submitted (S212) to make technical changes to this section regarding the blocking between joists, rafters or trusses particularly at high-heel or cantilevered trusses. The 2009 IBC language specifically stated that the blocking was required to be "full-height". As a result of working with other stake-holders and industry representatives, a provision was written into S211 to allow the blocking to stop 2 inches short of the roof sheathing. This provision was intended as a method of allowing for the required venting. Reports and analysis were cited that indicated that the cross-grain bending of the rafter or truss chord was not a significant concern and that the diaphragm forces could be transferred through typical connections and fastening per Table 2304.9.1. However, there has been concern raised since that time that the 2 inch gap at the top causes a disconnect in the lateral load path and is not consistent with referenced standards and other sections of the IBC.

All diaphragm testing and accepted allowable diaphragm shear value tables (past and present) are based on diaphragms having boundary nailing. This nailing is required to transfer diaphragm shears into the boundary elements (shear walls and/or collectors and struts), in accordance with IBC section 1602.1 and ASCE7 section 11.2. If a 2" air gap is allowed between the sheathing and the top of the blocking, this shear transfer cannot happen and the allowable shear values should not be allowed to be used.

The definition of a diaphragm boundary from the 2012 IBC states;

Diaphragm boundary. *In light-frame construction, a location where shear is transferred into or out of the diaphragm sheathing. Transfer is either to a boundary element or to another force-resisting element.*

IBC section 1604.4, ASCE 7 section 1.3.5, and SDPWS sections 4.1.1 and 4.2.6 all require complete load paths. Since the 2" air gap does not allow a direct load path for the transfer of diaphragm shears to the blocking, then down into the shear walls or collectors, an alternate load path must be provided. With the 2" gap, the diaphragm shears and resulting load path must be transferred through the unsupported diaphragm sheathing, which must act as the initial diaphragm boundary element taking tension and compression (not allowed by IBC section 2305.1.2 and SDPWS section 4.1.4), then into the trusses or joists, then by bearing (assuming full bearing is achieved) into the blocking, and then down into the boundary element. Past and present testing has shown that eliminating blocking, providing partial (skip) blocking or reducing the height of blocking produces failure modes that are undesirable (i.e. trust/joist rotation, loss of gang-nail plates by popping off from cross grain shear forces being applied, or shifting of loads to other members that were not designed to receive those loads). At the very least, the gap should occur at the bottom of the blocking so that the boundary nailing can be installed. However, doing so will not resolve the bad testing failure modes.

Installing blocking only over the shear walls would create shears in the blocking and its connections (transferring the shears into the framing) in excess the connection capacity shown in the prescriptive fastening schedules in the IBC tables, and would also eliminate the boundary elements connecting the shear walls together. This violates IBC sections 1602.1 (boundary member and chord), 2302, 2305.1.2, SDPWS sections 4.1.4, 4.1.1 and 4.2.6, and ASCE 7 sections 11.2, 12.10.2 and 1.3.5. The shears are not only being applied in the plane of the wall. Loads are applied to the diaphragm in both the transverse and longitudinal directions. When the loads are applied in the transverse direction (perpendicular to the wall), without blocking, or if installed only at the shear walls, the diaphragm sheathing is the only element that can act as the diaphragm chord because the shears cannot be transferred to the blocking and therefore the sheathing must take all of the tension and compression forces, which is in direct violation with the code.

Cost Impact: This change would require that the blocking be 2 inches taller than what is currently required. The additional cost would be negligible. In addition, this change would require boundary nailing (6 inch o.c.) of the roof sheathing to the blocking along the braced wall line. That would be an additional, but undetermined, cost..

S279-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.3.2.2-S-RICE-MALONE.doc

S280–12
2308.2.2

Proponent: Robert Rice, C.B.O., Josephine County, OR, representing Oregon Building Officials Association (structdesigner@yahoo.com)

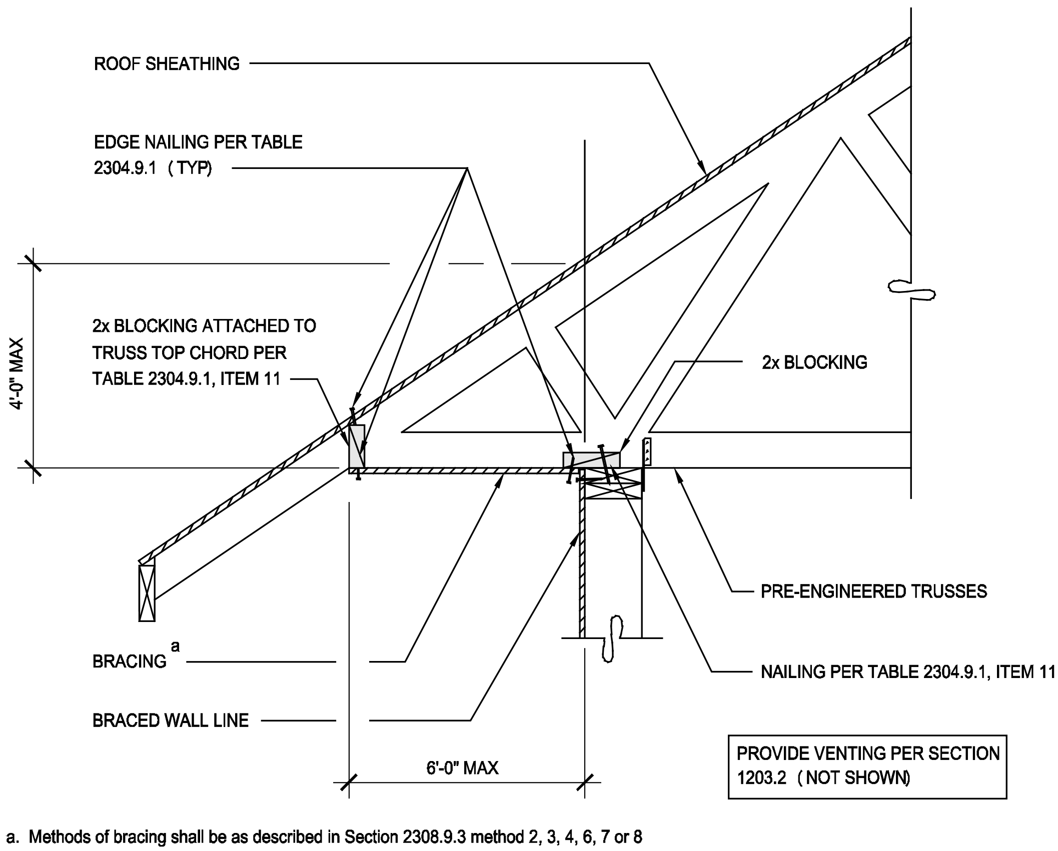
Revise as follows:

2308.3.2.2 Top plate connection. Where joists and/or rafters are used, braced wall line top plates shall be fastened over the full length of the braced wall line to joists, rafters, rimboards or blocking above in accordance with Table 2304.9.1, Items 11, 12, 15 or 19, as applicable, based on the orientation of the joists or rafters to the braced wall line. Blocking at joists with walls above shall be equal to the depth of the joist at the braced wall line. Blocking at rafters need not be full depth but shall extend to within 2 inches (51 mm) from the roof sheathing above. Blocking shall be a minimum of 2 inches (51 mm) nominal thickness and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11. Notching or drilling of holes in blocking in accordance with the requirements of Section 2308.8.2 or Section 2308.10.4.2 shall be permitted.

At exterior gable end walls braced wall panel sheathing in the top *story* shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15 240 mm).

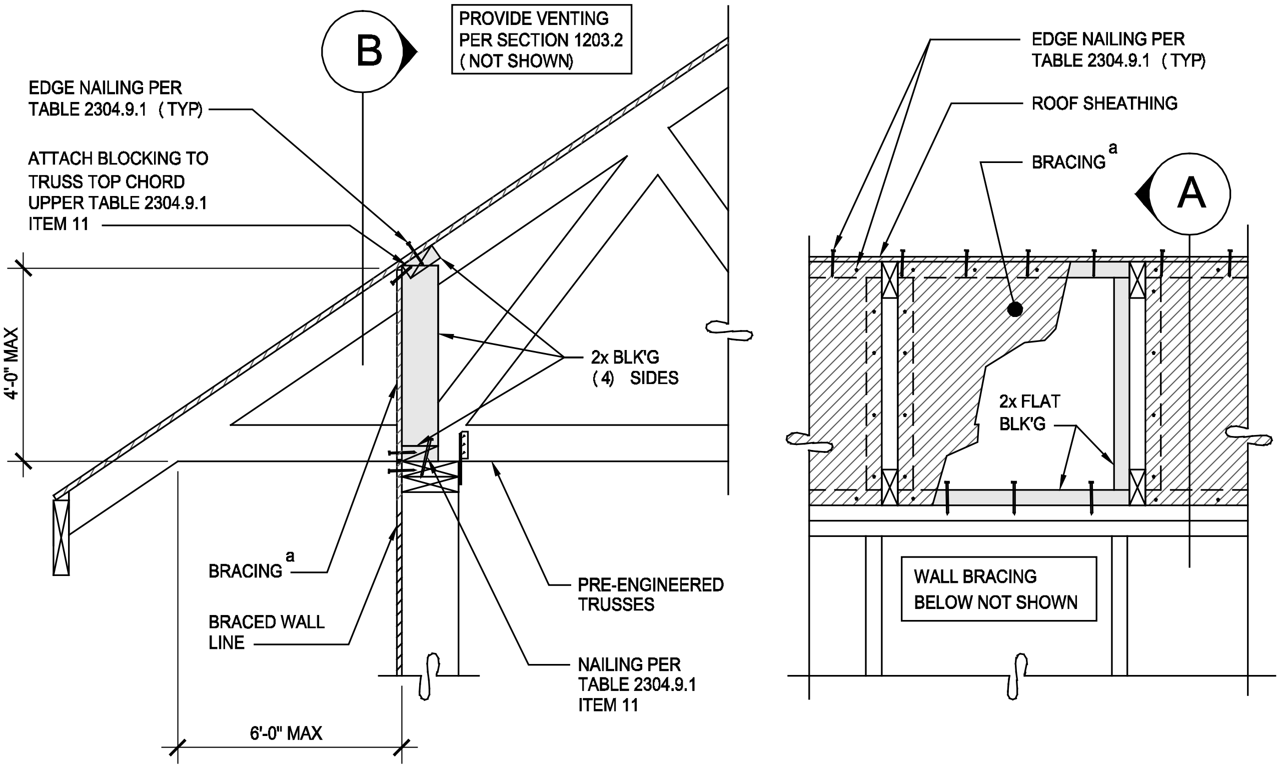
Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall over the full length of the braced wall line by blocking of the ends of the trusses or by other *approved* methods providing equivalent lateral force transfer. Blocking shall be minimum 2 inch (51 mm) nominal thickness and shall extend to within 2 inches (51 mm) from the roof sheathing above and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11. Notching or drilling of holes in blocking in accordance with the requirements of Section 2308.8.2 or Section 2308.10.4.2 shall be permitted.

> <u>**Exception**. Where the roof sheathing is greater than 9-1/4 inches (235 mm) above the top plate solid blocking is not required when the framing members are connected in accordance with one of the following methods:</u>
>
> 1. <u>In accordance with Figure 2308.3.2 (1)</u>
> 2. <u>In accordance with Figure 2308.3.2 (2)</u>
> 3. <u>With full height engineered blocking panels designed for values listed in American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM).</u>
> 4. <u>Designed in accordance with accepted engineering methods.</u>



<u>For SI: 1 inch = 25.4 mm</u>
<u>a. Methods of bracing shall be as described in Section 2308.9.3, method 2,3,4,6,7 or 8</u>

<u>FIGURE 2308.3.2(1)</u>
<u>BRACED WALL LINE TOP PLATE CONNECTION</u>



A SECTION

B ELEVATION

For SI: 1 inch = 25.4 mm
a. Methods of bracing shall be as described in Section 2308.9.3, method 2,3,4,6,7 or 8

FIGURE 2308.3.2 (2)
BRACED WALL PANEL TOP PLATE CONNECTION

TABLE 2304.9.1
FASTENING SCHEDULE

CONNECTION	FASTENING[a]	LOCATION
1. Joist to sill or girder	3 - 8d common (2 1/2" x 0.131") 3 – 3 x 0.131 nails 3 – 3" x 14 gage staples	toenail
2. Bridging or blocking to joist, rafter or truss	2 - 8d common (2 1/2" 0.131") 2 – 3 x 0.131" nails 2 – 3" x 14 gage staples	toenail each end
11. Blocking between joists, ~~or~~ rafters or truss to top plate Blocking between rafters or truss not at the wall top plate, to rafter or truss	3 - 8d common (2 1/2" x 0.131") 3 – 3" x 0.131 nails 3 – 3" 14 gage staples 2 - 8d common (2 1/2" x 0.131") 2 – 3" x 0.131" nails 2 – 3" 14 gage staples 2 - 16d common (3 1/2" x 0.162") 3 – 3" x 0.131" nails 3 – 3" x 14 gage staples	toenail toenail each end endnail

(Portions of table not shown remain unchanged)

Reason: The 2012 IBC has fairly clear wording in Section 2308.3.2 that when the Conventional Light-Frame Construction provisions are used that the diaphragms need to be connected to the braced wall line to resist wind and seismic (lateral) forces and states.

The prescriptive provisions of "conventional light-frame construction" as provided for in section 2308 are very limited in scope. In section 2308.2 they are limited to:

1. Three stories max (two stories max in SDC C, one story in SDC D and above)
2. Max floor to floor height of 11'-7"
3. Max dead loads of 15 psf
4. Floor live load of 40 psf max
5. Ground snow of 50 psf max
6. Wind speeds of 100 max
7. Roof truss span of 40 feet max between vertical supports
8. Not allowed to be used for Occupancy Category IV buildings in SDC B,C,D,E

9 More restrictive requirements for SDC B,C, D and E defined in 2308.11.

10 Even more restrictive requirements specifically for SDC D and E

11. Limited by "irregular structures" definitions in 2308.12.6
12. Braced wall line spacing 35 feet max each direction, each floor.
13. In SDC D and E max spacing is 25 feet. (IRC allow exception up to 50 feet)

In other words, due to the limitations listed above as well as the other limitations in the code not listed here, the structures that are built with the provisions of section 2308 are small, light-framed buildings that do not have the significant lateral loading that other buildings do.

The alternate provisions in the exceptions are intended to address the increasingly common occurrence of cantilevered/high-heel trusses. This occurs due to insulation requirements and to provide a cantilevered portion of roof to be an exterior covered porch. The current provisions of this section of code do not cover this common condition. The current code language requires that "Blocking shall be a minimum of 2 inches (51 mm) nominal thickness…" This does not work for heights greater than what a 2x 10 or 2x 12 will accommodate.

The current code text (IBC) states the intention of connecting the braced wall line to the roof or floor diaphragm above in section 2308.3.2. A similar version of this proposal was adopted as an Oregon amendment in 2006 for the adoption of the 2006 IBC and has worked well for many years and two more code cycles Since then, countless hours have gone into developing proposals for both the IRC and the IBC code development process. The IRC proposal was approved in Minneapolis for the 2009 code. During the process of resolving concerns and developing a consensus changes were made to the proposal. Based on engineering reports and historical data, an exception was made for low heel connections (9 ¼") in lower wind and seismic zones to not require the blocking.

This proposal does not add additional requirements to the code. This proposal clarifies that the connection needs to occur and provides prescriptive solutions when solid blocking, per the current text, is not possible or is impractical..

Per accepted engineering practice for lateral design loads, the floor and roof diaphragms transmit wind and seismic loads into the braced walls (engineered shearwalls or prescriptive braced panels). The fact that the diaphragm needs to be connected to the braced wall line to complete the load path is often not fully understood by plans examiners, inspectors and contractors. The typical requirement that is intended by the code is that full height solid blocking occur at this connection with edge nailing to the blocking and the blocking connected to the top plate of the wall to transfer the diaphragm (plf) force to the wall top plates. This is evidenced in the IBC by the exception to irregular structures stating, *"..lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses..".* In order for the forces to be transferred there has to be a connection capable of transferring the diaphragm shear evenly to the top plates.

Without this clarification of the text it is a connection that may or may not occur based on what I have seen in the field and have discussed with code officials. The blocking that is called for in the code serves three functions. It provides closure to prevent animals, birds, etc. from entering the attic space, it prevents the trusses or rafters from "rolling over" and it transfers the diaphragm forces to the wall. Most code officials, inspectors and contractors understand the first two objectives. However, the latter is a concept that is often not fully understood. This needs to be perceived, understood and implemented in a uniform way.

In addition, rather than identify a problem without providing a solution, my proposal includes two details to accomplish this connection simply. The solutions are, in principle, fundamentally extending the roof diaphragm sheathing to the wall top plates either vertically in the truss bays or horizontally through the soffit. No design is required since it is just completing the load path with the already defined sheathing and nailing.

Without prescriptive provisions in the current code this condition would require engineering or, as stated in 2308.3.2, Exception to item 1 "..by other approved methods." would be left up to the Authority Having Jurisdiction to determine what is acceptable without any guidance or uniformity between jurisdictions.

Typically, the engineering solution would provide details similar to those included in this proposal. Therefore, the solution and construction costs would not change. Costs would be reduced by eliminating additional costs for engineering where these prescriptive solutions work.

Cost Impact: The code change proposal will not increase the cost of construction.

S280-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.3.2.2-S-RICE.doc

S281–12

2308.7, 2308.9.1, 2308.9.5.1, 2308.9.5.2, 2308.9.6, Table 2308.9.5, Table 2308.9.6

Proponent: Paul Coats, PE, CBO, American Wood Council (pcoats@awc.org)

Revise as follows:

2308.7 Girders. Girders for single-story construction or girders supporting loads from a single floor shall not be less than 4 inches by 6 inches (102 mm by 152 mm) for spans 6 feet (1829 mm) or less, provided that girders are spaced not more than 8 feet (2438 mm) o.c. ~~Spans for built-up 2-inch (51 mm) girders shall be in accordance with Table 2308.9.5 or 2308.9.6. Other girders~~ Girders shall be designed to support the loads specified in this code. Girder end joints shall occur over supports. Where a girder is spliced over a support, an adequate tie shall be provided. The ends of beams or girders supported on masonry or concrete shall not have less than 3 inches (76 mm) of bearing.

2308.9.1 Size, height and spacing. The size, height and spacing of studs shall be in accordance with Table 2308.9.1 except that utility-grade studs shall not be spaced more than 16 inches (406 mm) o.c., or support more than a roof and ceiling, or exceed 8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior nonload-bearing walls. Studs shall be continuous from a support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

> **Exception:** Jack studs, trimmer studs and cripple studs at openings in walls that comply with ~~Table 2308.9.5~~ Section 2308.9.5.2.

2308.9.5.1 Headers. Headers shall be provided over each opening in exterior-bearing walls. ~~The spans in Table 2308.9.5 are permitted to be used for one- and two-family *dwellings*.~~ Headers ~~for other buildings~~ shall be designed in accordance with Section 2301.2, Item 1 or 2. Headers shall be of two or more pieces of nominal 2-inch (51 mm) framing lumber set on edge ~~as permitted by Table 2308.9.5~~ and nailed together in accordance with Table 2304.9.1 or of solid lumber of equivalent size.

2308.9.5.2 Header support. Wall studs shall be designed to support the ends of the header ~~in accordance with Table 2308.9.5~~. Each end of a lintel or header shall have a length of bearing of not less than 1 1/2 inches (38 mm) for the full width of the lintel.

2308.9.6 Openings in interior bearing partitions. Headers shall be provided over each opening in interior bearing partitions as required in Section 2308.9.5. ~~The spans in Table 2308.9.6 are permitted to be used.~~ Wall studs shall support the ends of the header in accordance with ~~Table 2308.9.5 or 2308.9.6, as appropriate~~ Section 2308.9.5.2.

~~TABLE 2308.9.5~~
~~HEADER AND GIRDER SPANS[a] FOR EXTERIOR BEARING WALLS~~
~~(Maximum Spans for Douglas Fir-Larch, Hem-Fir, Southern Pine and Spruce-Pine-Fir[b] and Required Number of Jack Studs)~~

~~TABLE 2308.9.6~~
~~HEADER AND GIRDER SPANS[a] FOR INTERIOR BEARING WALLS~~
~~(Maximum Spans for Douglas Fir-Larch, Hem-Fir, Southern Pine and Spruce-Pine-Fir[b] and Required Number of Jack Studs)~~

Reason: Deletion of Table 2308.9.5 and Table 2308.9.6 without replacement is proposed because of limited applicability of the tabulated header spans resulting from the exclusion of detached one- and two-family dwellings from the scope of 2308 and the live load limitation of 40 psf per 2308.2. In addition, the species-based header spans are subject to being dated should design values change. Design value-based prescriptive engineered options for header spans are available from other sources. For example, header spans for conditions covered by Table 2308.9.5 and Table 2308.9.6, as well as support of headers by use of jack studs providing full bearing, can be found in the WFCM.

Specific reference to "one- and two- family dwellings" from 2308.9.5.1 is deleted to coordinate with the exclusion of detached one-and two-family dwellings from the scope of 2308. Other text sections are revised to coordinate with removal of the Tables.

Cost Impact: The code change proposal will not increase the cost of construction.

S281-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.7-S-COATS.doc

S282–12
2308.8.5

Proponent: Robert Rice, C.B.O., Josephine County, OR, representing Oregon Building Officials Association (structdesigner@yahoo.com)

Revise as follows:

2308.8.5 Lateral support. Floor, *attic* and roof framing with a nominal depth-to-thickness ratio greater than or equal to 5:1 shall have ~~one~~ the compression edge held in line for the entire span. Where the nominal depth-to-thickness ratio of the framing member exceeds 6:1, there shall be one line of bridging for each 8 feet (2438 mm) of span, unless both edges of the member are held in line. The bridging shall consist of not less than 1-inch by 3-inch (25 mm by 76 mm) lumber, double nailed at each end, of equivalent metal bracing of equal rigidity, full-depth solid blocking or other *approved* means. A line of bridging shall also be required at supports where equivalent lateral support is not otherwise provided.

Reason: This proposal clarifies the requirements of the existing code language. The first sentence requires framing with a depth-to-thickness ratio greater or equal to 5:1 (e.g. 2x10) to have **"…one edge held in line…".** The second sentence states that when the depth-to-thickness ratio exceeds 6:1 (e.g. 2x12) "…there shall be one **line of bridging** for each 8 feet of the span…." in addition to the requirement above unless "both edges of the member are **held in line."** The remainder of the section describes what the bridging shall be. What is missing from the first sentence is the clarification that it is the compression flange that requires bracing or "support". This is consistent with accepted engineering practice and design standards such as the *National Design Specification published by American Forest and Paper Association.*

The Commentary states,

When the depth-to-thickness ratio of joists and rafters exceeds 5:1, as would be the case in members larger than 2 inches by 10 inches (51 mm by 254 mm), the lateral support required by Ssection 2308.8.2 is not sufficient to prevent ***lateral buckling*** *between supports. Additional resistance is required.* ***Sheathing, subflooring, decking and similar materials*** *attached to each joist or rafter are considered to provide edge restraint. These requirements are cumulative. The support required by Section 2308.8.2 applies to all joists. Additionally, members greater than 2 inches by 10 inches (51 mm by 254 mm) must have one edge held in line, and members greater than 2 inches by 12 inches (51 mm by 305 mm) must have one edge held in line as well as a line of bridging at each 8 feet (2438 mm) of span (which may be omitted if both edges are held in line).*

As indicated by the commentary above, the concern is "*..lateral buckling between supports."* The susceptibility of lateral buckling for floor, attic or roof framing is due to an un-braced compression flange. Section 2308.8.2 requires that *"Joists shall be supported laterally at the ends and at each support by solid blocking except where the ends of the joists are nailed to a header, band or rim joist or to an adjoining stud or by other means."* The requirements of this section, 2308.8.5 are in addition to 2308.8.2 and are specifically to address out-of-plane buckling of the compression flange.

Cost Impact: The code change proposal will not increase the cost of construction. This proposal is intended to clarify the code and does not add any new requirement to the code.

S282-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.8.5-S-RICE.doc

S283–12

2308.8, Table 2308.8(1), Table 2308.8(2), 2308.10.2, Table 2308.10.2(1), Table 2308.10.2(2), 2308.10.3, Table 2308.10.3(1), Table 2308.10.3(2), Table 2308.10.3(3), Table 2308.10.3(4), Table 2308.10.3(5), Table 2308.10.3(6)

Proponent: Paul Coats, P.E. CBO, American Wood Council (pcoats@awc.org)

Revise as follows:

2308.8 Floor joists. Spans for floor joists shall be in accordance with ~~Table 2308.8(1) or 2308.8(2). For other grades and or species, refer to~~ the *AF&PA Span Tables for Joists and Rafters*.

~~TABLE 2308.8(1)~~
~~FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES~~
~~(Residential Sleeping Areas, Live Load = 30 psf, L/Δ = 360)~~

~~TABLE 2308.8(2)~~
~~FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES~~
~~(Residential Living Areas, Live Load = 40 psf, L/Δ = 360)~~

2308.10.2 Ceiling joist spans. Allowable spans for ceiling joists shall be in accordance with ~~Table 2308.10.2(1) or 2308.10.2(2). For other grades and species, refer to~~ the *~~AF&PA~~* *<u>AWC</u>* *Span Tables for Joists and Rafters*.

~~TABLE 2308.10.2(1)~~
~~CEILING JOIST SPANS FOR COMMON LUMBER SPECIES~~
~~(Uninhabitable Attics Without Storage, Live Load = 10 pounds psf, L/Δ = 240)~~

~~TABLE 2308.10.2(2)~~
~~CEILING JOIST SPANS FOR COMMON LUMBER SPECIES~~
~~(Uninhabitable Attics With Limited Storage, Live Load = 20 pounds per square foot, L/Δ = 240)~~

2308.10.3 Rafter spans. Allowable spans for rafters shall be in accordance with ~~Table 2308.10.3(1), 2308.10.3(2), 2308.10.3(3), 2308.10.3(4), 2308.10.3(5) or 2308.10.3(6). For other grades and species, refer to the~~ *~~AF&PA~~* <u>the</u> *<u>AWC</u>* *Span Tables for Joists and Rafters*.

~~TABLE 2308.10.3(1)~~
~~RAFTER SPANS FOR COMMON LUMBER SPECIES~~
~~(Roof Live Load = 20 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)~~

~~TABLE 2308.10.3(2)~~
~~RAFTER SPANS FOR COMMON LUMBER SPECIES~~
~~(Roof Live Load = 20 pounds per square foot, Ceiling Attached to Rafters, L/Δ = 240)~~

~~TABLE 2308.10.3(3)~~
~~RAFTER SPANS FOR COMMON LUMBER SPECIES~~
~~(Ground Snow Load = 30 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)~~

~~TABLE 2308.10.3(4)~~
~~RAFTER SPANS FOR COMMON LUMBER SPECIES~~
~~(Ground Snow Load = 50 pounds per square foot, Ceiling Not Attached to Rafters, L/Δ = 180)~~

~~**TABLE 2308.10.3(5)**~~
~~**RAFTER SPANS FOR COMMON LUMBER SPECIES**~~
~~**(Ground Snow Load = 30 pounds per square foot, Ceiling Attached to Rafters, L/Δ = 240)**~~

~~**TABLE 2308.10.3(6)**~~
~~**RAFTER SPANS FOR COMMON LUMBER SPECIES**~~
~~**(Ground Snow Load = 50 pounds per square foot, Ceiling Attached to Rafters, L/Δ = 240)**~~

Reason: Species- and grade-specific span tables are subject to becoming dated if design values for specific species or grades change, and therefore it is proposed to directly reference the AWC Span Tables for Joists and Rafters. The design value format of the tabulated spans in Span Tables for Joists and Rafters is not sensitive to design value changes for specific species and grades. Span Tables for Joists and Rafters is currently included as a reference in IBC 2306.

Cost Impact: The code change proposal will not increase the cost of construction.

S283-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.8-S-COATS.doc

S284–12
2308.9.2.1

Proponent: Edward L. Keith, APA – The Engineered Wood Association (ed.keith@apawood.org)

Revise as follows:

2308.9.2.1 Top plates. Bearing and *exterior wall* studs shall be capped with double top plates installed to provide overlapping at corners and at intersections with other partitions. End joints in double top plates shall be offset at least 48 inches (1219 mm), and shall be nailed with not less than eight 16d face nails on each side of the joint. Plates shall be a nominal 2 inches (51 mm) in depth and have a width at least equal to the width of the studs.

> **Exception:** A single top plate is permitted, provided the plate is adequately tied at joints, corners and intersecting walls by at least the equivalent of 3-inch by 6-inch (76 mm by 152 mm) by 0.036-inch-thick (0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d 2-1/2" x 0.113") nails or equivalent on each side of the joint. For the butt-joint splice between adjacent single top plates at least the equivalent of 3-inch by 12-inch (76 mm by 304 mm) by a 0.036-inch-thick (0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by twelve 8 d (2-1/2" x 0.113") nails on each side of the joint shall be required, provided the rafters, joists or trusses are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over headers that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described for the butt joint splice between adjacent single top plates

Reason: Item 10 of the 2012 IBC Table 2304.9.1 establishes the minimum capacity required to insure an adequate tension splice in top plates. Aside from simply providing continuity between wall segments, the top-plate splice also acts as a tension tie (often called a collector or drag strut) to distribute the roof and floor shear loads into the bracing elements often spaced as much as 20 feet apart. Assuming spruce-pine-fir top plates, Table 2304.9.1, item 10 requires a top-plate splice with eight 16d box nails on each side of the splice. In accordance with the NDS Table 11N, assuming SPF plates and a duration of load of 1.6 for lateral loads, the design capacity of the item 10 connection is (88 lb/nail x 8 nails x 1.6 dol =) 1,126 lbf.

While sufficient for intersections and corners the *3-inch by 6-inch (76 mm by 152 mm) by a 0.036-inch-thick (0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side…"* only provides about 600 lbf tension capacity (NDS Table 11P, SPF framing, box nails: 60 lbf/nail x 6 nails x 1.6 dol = 576 lbf). This is about ½ of what is required in Table 2304.9.1, item 10. As such, the splice plate requirement for in-line butt joints in single top plate systems should be twice what is currently required:

"… the equivalent of 3-inch by 12-inch (76 mm by 304) by a 0.036-inch-thick (0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by twelve 8d (2-1.2" x 0.113") nails on each side…"

As a matter of clarification, the type of nail to be used was defined by description as only the penny-weight was specified. This is in keeping with current code style guidelines. I also specified which splice type was appropriate for headers when present. This was taken from the IRC. As these are neither corners nor intersections, it is clear that the butt-joint splice was the appropriate reference.

Cost Impact: The code change proposal will not increase the cost of construction.

S284-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.2.1-S-KEITH.doc

S285–12

Table 2308.9.1, 2308.9.2.3

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Subcommittee – General Requirements Subcommittee (huston@smithhustoninc.com)

Revise as follows:

TABLE 2308.9.1
SIZE, HEIGHT, AND SPACING OF WOOD STUDS

STUD SIZE (INCHES)	**BEARING WALLS**				**NONBEARING WALLS**	
	Laterally unsupported stud height[a] (feet)	Supporting roof and ceiling only	Supporting one floor, roof and ceiling	Supporting two floors, roof and ceiling	Laterally unsupported stud height[a] (feet)	Maximum Stud ~~S~~spacing (inches)
		Maximum Stud ~~S~~spacing (inches)				
2x3[b]	-	-	-	-	10	16
2x4	10	24	16	-	14	24
3x4	10	24	24	16	14	24
2x5	10	24	24	-	16	24
2x6	10	24	24	16	20	24

For SI: 1 inch = 25.4mm, 1 foot = 304.8 mm.

a. Listed heights are distances between points of lateral support placed perpendicular to the plane of the wall. Increases in unsupported height are permitted where justified by an analysis.

b. Shall not be used in exterior walls.

2308.9.2.3 Nonload-bearing walls and partitions. In nonload-bearing walls and partitions, when not part of a braced wall line, studs shall be spaced not more than ~~28~~ 24 inches (~~711~~ 610 mm) o.c. ~~and~~ In interior nonload-bearing walls and partitions, are permitted to be set with the long dimension parallel to the wall. Where studs are set with the long dimensions parallel to the wall use of utility grade lumber or studs exceeding 10 feet (3048 mm) is not permitted. Interior nonbearing partitions shall be capped with no less than a single top plate installed to provide overlapping at corners and at intersections with other walls and partitions. The plate shall be continuously tied at joints by solid blocking at least 16 inches (406 mm) in length and equal in size to the plate or by 1/2-inch by 11/2-inch (12.7 mm by 38 mm) metal ties with spliced sections fastened with two 16d nails on each side of the joint.

Reason: Several minor modifications to nonbearing walls and partitions are proposed. Changes include:

1. Limit spacing to 24". Studs bending about the strong axis, as shown in Table 2308.9.1, are limited to 24" on center, so the same should also be applied to flat wise (weak axis bending) studs. Also note that the NDS, National Design Specification, the Repetitive Member Factor Cr is limited to framing members spaced not more than 24 inches on center.
2. Exclude the use of utility grade flat wise studs and studs over 10 feet in height because the bending stress exceeds the NDS allowable stress limits. For example, 2x4 #3 Spruce-Pine-Fir studs @ 28" o.c. have an allowable maximum span of 7'-6" versus the Table 2308.9.1 limit of 14'-0".
3. Limit to exclude braced wall lines, to match the requirements of IRC R602.5 which states the following:
   "**R602.5 Interior nonbearing walls.** Interior nonbearing walls shall be permitted to be constructed with 2 inch by 3 inch (51 mm by 76 mm) studs spaced 24 inches (610 mm) on center or, when part of a *braced wall line*, 2 inch by 4 inch (51 mm by 102 mm) flat studs spaced at 16 inches (406 mm) on center. Interior nonbearing walls shall be capped with at least a single top plate. Interior nonbearing walls shall be fireblocked in accordance with Section R602.8."
3. Add the words *Maximum Stud* before Spacing to better define the spacing limit. This will also to match the language in the wood stud table in the International Residential Code, IRC Table R602.3(5).
4. Change wording of nonbearing to nonload-bearing to match the definition as shown in IBC Section 202 and Section 2308.9.1

Cost Impact: The code change proposal will not increase the cost of construction.

S285-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.2.3-S-HUSTON.doc

S286–12
2308.9.2.3

Proponent: Robert Rice, C.B.O., Josephine County, OR, representing Oregon Building Officials Association (structdesigner@yahoo.com)

Revise as follows:

2308.9.2.3 Nonbearing walls and partitions. In nonbearing walls and partitions <u>that do not serve as *braced wall panels*</u>, studs shall be spaced not more than 28 inches (711 mm) o.c. and in interior nonbearing walls and partitions, are permitted to be set with the long dimension parallel to the wall. Interior nonbearing partitions shall be capped with no less than a single top plate installed to provide overlapping at corners and at intersections with other walls and partitions. The plate shall be continuously tied at joints by solid blocking at least 16 inches (406 mm) in length and equal in size to the plate or by 1/2-inch by 11/2-inch (12.7 mm by 38 mm) metal ties with spliced sections fastened with two 16d nails on each side of the joint.

Reason: This proposal clarifies that studs cannot be installed flat when interior walls serve as wall bracing walls and panels.

Cost Impact: The code change proposal will not increase the cost of construction.

S286-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.2.3-S-RICE.doc

S287–12

202 (NEW), 2302, 2308.9.3 (NEW), 2304.6, Table 2304.6, 2304.6.1, 2304.6.2,

Proponent: Paul Coats, American Wood Council, (pcoats@awc.org)

Add new text as follows:

SECTION 202
DEFINITIONS

GABLE. The triangular portion of the wall beneath a dual-slope, pitched, or mono-slope roof.

Revise as follows:

2302.1 Definitions. For the purposes of this chapter, and as used elsewhere in this code the following terms are defined in Chapter 2:

GABLE

2304.6 Exterior wall sheathing. ~~Except as provided for in Section 1405 for weatherboarding or where stucco construction that complies with Section 2510 is installed, enclosed buildings shall be sheathed with one of the materials of the nominal thickness specified in Table 2304.6 or any other *approved* material of equivalent strength or durability~~ Wall sheathing on the outside of exterior walls, including gables, and the connection of sheathing to framing shall be designed in accordance with the general provisions of this code and shall be capable of resisting wind pressures in accordance with Section 1609..

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the outside of exterior walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used elsewhere, but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). ~~Wood structural panel wall sheathing or siding used as structural sheathing shall be capable of resisting wind pressures in accordance with Section 1609. Maximum wind speeds for wood~~ Wood structural panel sheathing ~~used to resist wind pressures~~, connections, and framing spacing shall be in accordance with Table 2304.6.1 for the applicable wind speed and exposure category when used with enclosed buildings with a mean roof height not greater than 30 feet (9144 mm) and a topographic factor (K_{zt}) of 1.0.

~~2304.6.2~~ 2304.7 **Interior paneling.** Softwood wood structural panels used for interior paneling shall conform to the provisions of Chapter 8 and shall be installed in accordance with Table 2304.9.1. Panels shall comply with DOC PS 1, DOC PS 2 or ANSI/APA PRP 210. Prefinished hardboard paneling shall meet the requirements of CPA/ANSI A135.5. Hardwood plywood shall conform to HPVA HP-1.

2308.9.3 Exterior wall sheathing. Except where stucco construction that complies with Section 2510 is installed, the outside of exterior walls, including gables, of enclosed buildings shall be sheathed with one of the materials of the nominal thickness specified in Table 2308.9.3. with fasteners in accordance with requirements of 2304.9 or fasteners designed in accordance with accepted engineering practice.

TABLE ~~2304.6~~ 2308.9.3
MINIMUM THICKNESS OF WALL SHEATHING

SHEATING TYPE	MINIMUM THICKNESS	MAXIMUM WALL STUD SPACING
Wood boards	5/8 inch	24 inches on center
Fiberboard	1/2 inch	16 inches on center
Wood structural panel	In accordance with Tables 2308.9.3(2) and 2308.9.3(3)	--
M-S “Exterior Glue” and M-2	In accordance with Section	--

SHEATING TYPE	MINIMUM THICKNESS	MAXIMUM WALL STUD SPACING
“Exterior Glue” Particleboard	2306.3 and Table 2308.9.3(4)	
Gypsum sheathing	½ inch	16 inches on center
~~Gypsum wallboard~~	~~½ inch~~	~~24 inches on center~~
Reinforced cement mortar	1 inch	24 inches on center

For SI: 1 inch = 25.4 mm.

Reason: (2308.9.3) This new section comes from existing Section 2304.6. The content of the current section is moved to 2308.9.3 because it contains prescriptive minimum sheathings more suitable for wind speeds in accordance with limitations of 2308. The section is clarified as being applicable to exterior wall sheathing. The term “gable” is included to clarify that exterior wall sheathing recommendations are equally applicable to the gable.

Table 2304.6 is moved and renumbered as Table 2308.9.3. Gypsum wallboard is removed from the table to make it clear the table applies to exterior wall sheathing, in accordance with the proposed Section 2308.9.3.

Section 2304.6 is rewritten to establish minimum structural performance requirements and clarify that wall sheathing on the outside of exterior walls, as well as connection of sheathing to framing, must be capable of resisting wind pressures in accordance with Section 1609. The term “gable” is included to clarify that exterior wall sheathing recommendations for out of plane wind resistance are equally applicable to the gable.

Revisions to 2304.6.1 coordinate with the minimum structural performance requirements added in the new 2304.6. Prior language covering design for out of plane wind resistance is deleted because it is addressed in new section 2304.6. Reference to Table 2304.6.1 is revised to clarify that several factors are critical for determination of the applicable maximum wind speed including fastener schedule and stud spacing.

This renumbers Section 2304.6.2 to 2304.7 to separate provisions for Interior Paneling from 2306.6 which would contain new provisions applicable to exterior wall sheathing but not to interior paneling.

A definition is added for “gable” used in proposed revisions in Item #1 and #2 to clarify that gables should be sheathed in accordance with provisions for walls.

Cost Impact: The code change proposal will not increase the cost of construction.

S287-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.3 (NEW)-S-COATS.doc

S288–12
2308.9.3

Proponent: Paul Coats, P.E., CBO, American Wood Council (pcoats@awc.org)

Revise as follows:

2308.9.3 Bracing. Braced wall lines shall consist of braced wall panels that meet the requirements for location, type and amount of bracing as shown in Figure 2308.9.3, specified in Table 2308.9.3(1) and are in line or offset from each other by not more than 4 feet (1219 mm). Braced wall panels shall start not more than 12 1/2 feet (3810 mm) from each end of a braced wall line. Braced wall panels shall be clearly indicated on the plans. Construction of braced wall panels shall be by one of the following methods:

1. Nominal 1-inch by 4-inch (25 mm by 102 mm) continuous diagonal braces let into top and bottom plates and intervening studs, placed at an angle not more than 60 degrees (1.0 rad) or less than 45 degrees (0.79 rad) from the horizontal and attached to the framing in conformance with Table 2304.9.1.
2. Wood boards of 5/8 inch (15.9 mm) net minimum thickness applied diagonally on studs spaced not over 24 inches (610 mm) o.c.
3. Wood structural panel sheathing with a thickness not less than 3/8 inch (9.5 mm) for 16-inch (406 mm) or 24-inch (610 mm) stud spacing in accordance with Tables 2308.9.3(2) and 2308.9.3(3).
4. Fiberboard sheathing panels not less than 1/2 inch (12.7 mm) thick applied vertically or horizontally on studs spaced not over 16 inches (406 mm) o.c. where installed with fasteners in accordance with ~~Section 2306.6 and Table 2306.6~~ <u>Table 2304.9.1</u>.
5. Gypsum board [sheathing 1/2-inch-thick (12.7 mm) by 4-feet-wide (1219 mm) wallboard or veneer base] on studs spaced not over 24 inches (610 mm) o.c. and nailed at 7 inches (178 mm) o.c. ~~with nails as required by Table 2306.7~~ <u>along panel edges (including top and bottom plates) and 7” o.c. in the field with 5d (0.086 inch diameter) cooler nails</u>.
6. Particleboard wall sheathing panels where installed in accordance with Table 2308.9.3(4).
7. Portland cement plaster on studs spaced 16 inches (406 mm) o.c.installed in accordance with Section 2510.
8. Hardboard panel siding where installed in accordance with Section 2303.1.6 and Table 2308.9.3(5).

For cripple wall bracing, see Section 2308.9.4.1. For Methods 2, 3, 4, 6, 7 and 8, each panel must be at least 48 inches (1219 mm) in length, covering three stud spaces where studs are spaced 16 inches (406 mm) apart and covering two stud spaces where studs are spaced 24 inches (610 mm) apart.

For Method 5, each panel must be at least 96 inches (2438 mm) in length where applied to one face of a panel and 48 inches (1219 mm) where applied to both faces. All vertical joints of panel sheathing shall occur over studs and adjacent panel joints shall be nailed to common framing members. Horizontal joints shall occur over blocking or other framing equal in size to the studding except where waived by the installation requirements for the specific sheathing materials. Sole plates shall be nailed to the floor framing and top plates shall be connected to the framing above in accordance with Section 2308.3.2. Where joists are perpendicular to braced wall lines above, blocking shall be provided under and in line with the braced wall panels.

Reason: In the 2012 code, some provisions for fasteners in Chapter 23 were removed and the AF&PA Special Design Provisions for Wind and Seismic was referenced instead. This proposed change cleans up some references to tables that are no longer applicable, while retaining prescriptive guidance in the code for conventional wall bracing methods. For fiberboard sheathing attachment, Section 2306.6 and Table 2306.6 are no longer applicable. In the 2012 IBC, Table 2304.9.1 would be an appropriate reference for fastener size for attachment of fiberboard sheathing. Table 2306.7 is no longer the correct reference in the 2012 IBC for gypsum wallboard attachment. The appropriate fastener, 5d cooler nails, is proposed for consistency with Table 2308.12.4 which addresses nail size for gypsum wallboard bracing used in Seismic Design Category D and E.

Cost Impact: The code change proposal will not increase the cost of construction.

S288-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.3-S-COATS.doc

S289–12
2308.9.3

Proponent: Michael Gardner, Gypsum Association (mgardner@gypsum.org)

Revise as follows:

2308.9.3 Bracing. Braced wall lines shall consist of braced wall panels that meet the requirements for location, type and amount of bracing as shown in Figure 2308.9.3, specified in Table 2308.9.3(1) and are in line or offset from each other by not more than 4 feet (1219 mm). Braced wall panels shall start not more than 12 1/2 feet (3810 mm) from each end of a braced wall line. Braced wall panels shall be clearly indicated on the plans. Construction of braced wall panels shall be by one of the following methods:

1. Nominal 1-inch by 4-inch (25 mm by 102 mm) continuous diagonal braces let into top and bottom plates and intervening studs, placed at an angle not more than 60 degrees (1.0 rad) or less than 45 degrees (0.79 rad) from the horizontal and attached to the framing in conformance with Table 2304.9.1.
2. Wood boards of 5/8 inch (15.9 mm) net minimum thickness applied diagonally on studs spaced not over 24 inches (610 mm) o.c.
3. Wood structural panel sheathing with a thickness not less than 3/8 inch (9.5 mm) for 16-inch (406 mm) or 24-inch (610 mm) stud spacing in accordance with Tables 2308.9.3(2) and 2308.9.3(3).
4. Fiberboard sheathing panels not less than 1/2 inch (12.7 mm) thick applied vertically or horizontally on studs spaced not over 16 inches (406 mm) o.c. where installed with fasteners in accordance with Section 2306.6 and Table 2306.6.
5. Gypsum board [sheathing 1/2-inch-thick (12.7 mm) or 5/8-inch-thick (15.9 mm) by 4-feet-wide (1219 mm) wallboard or veneer base] on studs spaced not over 24 inches (610 mm) o.c. and ~~nailed~~ fastened to studs at 7 inches (178 mm) o.c. with nails ~~as required by Table 2306.7.~~ or screws. Nails or screws shall be installed in the field of the board and at board edges. Nails and screws shall comply with Section 2506.2. Nails shall be annular ringed and not less than 1 ½ inches in length. Screws shall be not less than 1 ¼ inches in length.
6. Particleboard wall sheathing panels where installed in accordance with Table 2308.9.3(4).
7. Portland cement plaster on studs spaced 16 inches (406 mm) o.c.installed in accordance with Section 2510.
8. Hardboard panel siding where installed in accordance with Section 2303.1.6 and Table 2308.9.3(5).

For cripple wall bracing, see Section 2308.9.4.1. For Methods 2, 3, 4, 6, 7 and 8, each panel must be at least 48 inches (1219 mm) in length, covering three stud spaces where studs are spaced 16 inches (406 mm) apart and covering two stud spaces where studs are spaced 24 inches (610 mm) apart.

For Method 5, each panel must be at least 96 inches (2438 mm) in length where applied to one face of a panel and 48 inches (1219 mm) where applied to both faces. All vertical joints of panel sheathing shall occur over studs and adjacent panel joints shall be nailed to common framing members. Horizontal joints shall occur over blocking or other framing equal in size to the studding except where waived by the installation requirements for the specific sheathing materials. Sole plates shall be nailed to the floor framing and top plates shall be connected to the framing above in accordance with Section 2308.3.2. Where joists are perpendicular to braced wall lines above, blocking shall be provided under and in line with the braced wall panels.

Reason: The proposal adds screws as an acceptable method of panel attachment when gypsum board is used as bracing. It also adds 5/8-inch-thick gypsum board to the list of materials used for bracing in structures constructed to the IBC.

The ability to use screws for the attachment of gypsum board used as bracing was inserted into the International Residential Code by the approval of Public Comment 2 on Proposal RB143 – 07/08. For consistency, similar language should be inserted into the IBC.

The addition of 5/8-inch-thick gypsum board to the text reflects the use of the thicker, when compared to ½ thick gypsum board, material commonly installed in structures constructed to the IBC. The bracing capability of the thicker material is greater than that of the thinner material, so the addition of the reference will not diminish the bracing attributes of the structure.

The reference to Section 2506.2 establishes that the nail or screw must comply with the minimum head size and shank diameter requirements in the appropriate standard in Table 2506.2. The standards referenced in Table 2506.2 are the same standards referenced in the IRC.

The nail and screw length minimum contained in the proposal establishes a fastener length that is no less than the length of the equivalent fastener as prescribed by the IRC for installation of gypsum board used as bracing. Because Table R702.3.5. of the IRC lists four potential nail types, the language requiring the use of an annular ringed nail – a common drywall nail – is inserted. Fastener lengths also reflect the minimum fastener length requirements contained in GA-216, Application and Finishing of Gypsum Board that is referenced in Section 2508 of the IBC.

While the literature presented as substantiation for the IRC modification indicated that a broader spacing for screws, when compared to nails, is justified, it is recommended that, for simplicity and consistency of installation, a one-for-one swap of screws for nails reflecting the current spacing contained in the text is more appropriate. The spacing in this proposal is identical to the spacing presently contained in Table R602.10.4 of the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

S289-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.3-S-GARDNER.doc

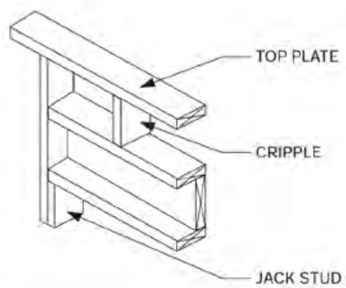
S290–12
2308.9.5.1, Figure 2308.9.5.1.1(1) (NEW), Figure 2308.9.5.1.1(2), 2308.9.5.1.1 (NEW)

Proponent: Paul Coats, American Wood Council (pcoats@awc.org)

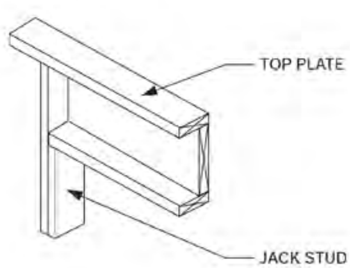
Revise as follows:

2308.9.5.1 Headers. Headers shall be provided over each opening in exterior-bearing walls. The spans in Table 2308.9.5 are permitted to be used for one- and two-family *dwellings*. Headers for other buildings shall be designed in accordance with Section 2301.2, Item 1 or 2. Headers ~~shall be~~ of two <u>or more</u> pieces of nominal 2-inch (51 mm) framing lumber <u>shall be</u> set on edge as permitted by Table 2308.9.5 and nailed together in accordance with Table 2304.9.1 or of solid lumber of equivalent size.

<u>**2308.9.5.1.1 Single member headers.** Single member headers shall be permitted when attached to a single flat 2-inch-nominal (51 mm) member or wall plate not less in width than the wall studs on the top and bottom of the header in accordance with Figures 2308.9.5.1.1(1) and 2308.9.5.1.1(2). Single-ply headers shall be designed in accordance with Section 2301.2, Item 1 or 2.</u>



<u>**FIGURE 2308.9.5.1.1(1) SINGLE MEMBER HEADER IN EXTERIOR BEARING WALL**</u>



<u>**FIGURE 2308.9.5.1.1(2) ALTERNATIVE SINGLE MEMBER HEADER WITHOUT CRIPPLE**</u>

Reason: The single ply header option is added for consistency with similar construction provisions for single ply header in the IRC. The figure illustrates recommended use of 2x material flat-wise as a method to provide resistance to out of plane wind loads as well as to brace the less stable single ply header when compared to a typical 2-ply header. Allowable spans for single ply headers are tabulated in the WFCM.

Cost Impact: The code change proposal will not increase the cost of construction.

S290-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.9.5.1-S-COATS.doc

S291–12
2308.9.3.2, Figure 2308.9.3.2

Proponent: Edward L. Keith, P.E., APA – The Engineered Wood Association (ed.keith@apawood.org)

Revise as follows:

2308.9.3.2 Alternate bracing wall panel adjacent to a door or window opening. Any bracing required by Section 2308.9.3 is permitted to be replaced by the following when used adjacent to a door or window opening with a full-length header:

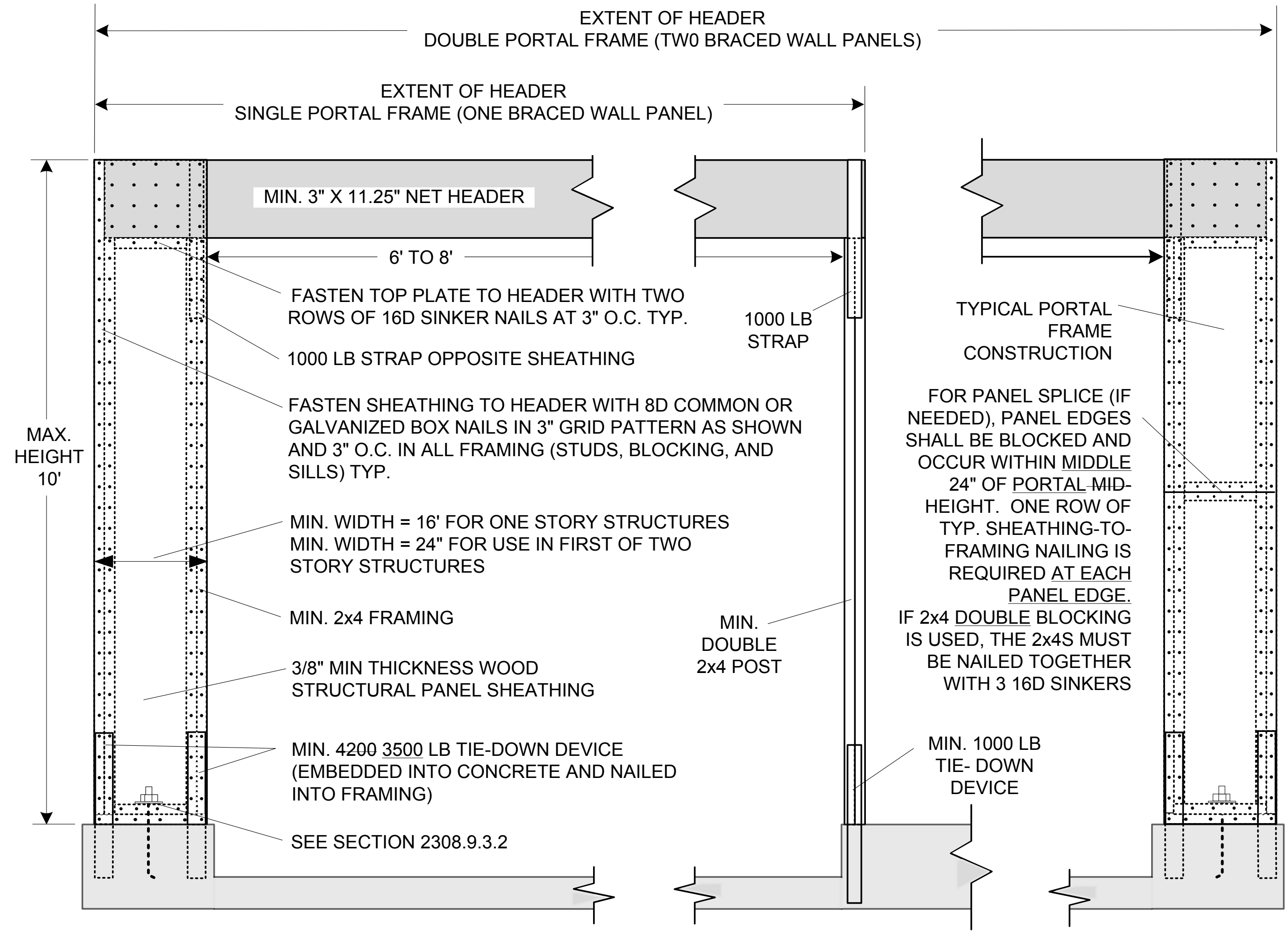
1. In one-story buildings, each panel shall have a length of not less than 16 inches (406 mm) and a height of not more than 10 feet (3048 mm). Each panel shall be sheathed on one face with a single layer of 3/8 inch (9.5 mm) minimum thickness wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Figure 2308.9.3.2. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure 2308.9.3.2. A built-up header consisting of at least two 2 × 12s and fastened in accordance with Item 24 of Table 2304.9.1 shall be permitted to be used. A spacer, if used, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. The clear span of the header between the inner studs of each panel shall be not less than 6 feet (1829 mm) and not more than 18 feet (5486 mm) in length. A strap with an uplift capacity of not less than 1,000 pounds (4,400 N) shall fasten the header to the inner studs opposite the sheathing. One anchor bolt not less than 5/8 inch (15.9 mm) diameter and installed in accordance with Section 2308.6 shall be provided in the center of ach sill plate. The studs at each end of the panel shall have a tie-down device fastened to the foundation with an uplift capacity of not less than ~~4,200~~ <u>3,500</u> pounds (~~18 480~~ <u>15 570</u> N).

   Where a panel is located on one side of the opening, the header shall extend between the inside face of the first full-length stud of the panel and the bearing studs at the other end of the opening. A strap with an uplift capacity of not less than 1,000 pounds (4400 N) shall fasten the header to the bearing studs. The bearing studs shall also have a tie-down device fastened to the foundation with an uplift capacity of not less than 1,000 pounds (4400 N).

   The tie-down devices shall be an embedded strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom.

   Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch by 12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped not less than 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

2. In the first *story* of two-story buildings, each wall panel shall be braced in accordance with Item 1 bove, except that each panel shall have a length of not less than 24 inches (610 mm).



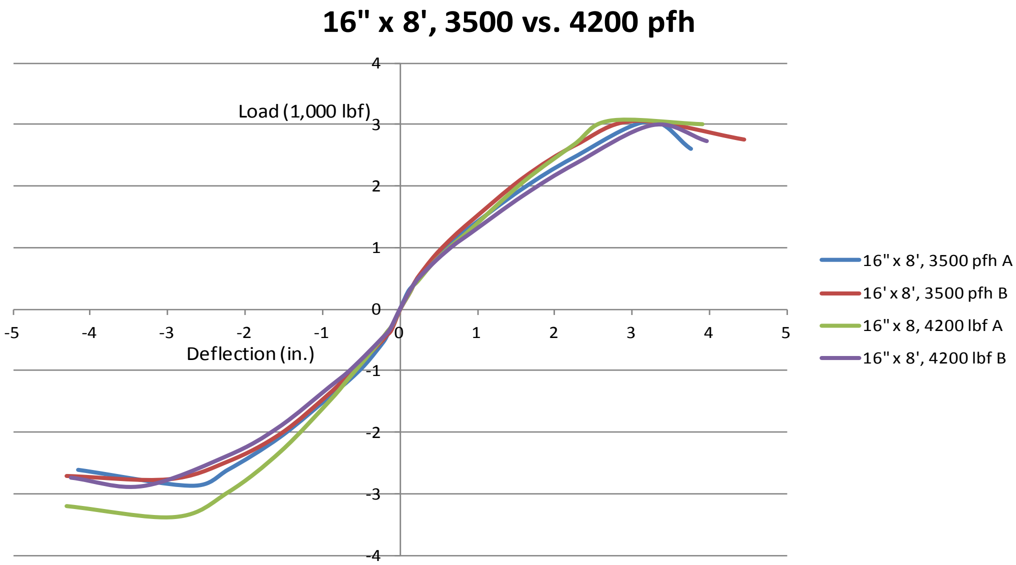
~~FIGURE 2308.9.3.2~~
~~ALTERNATE BRACED WALL PANEL ADJACENT TO A DOOR OR WINDOW OPENING~~

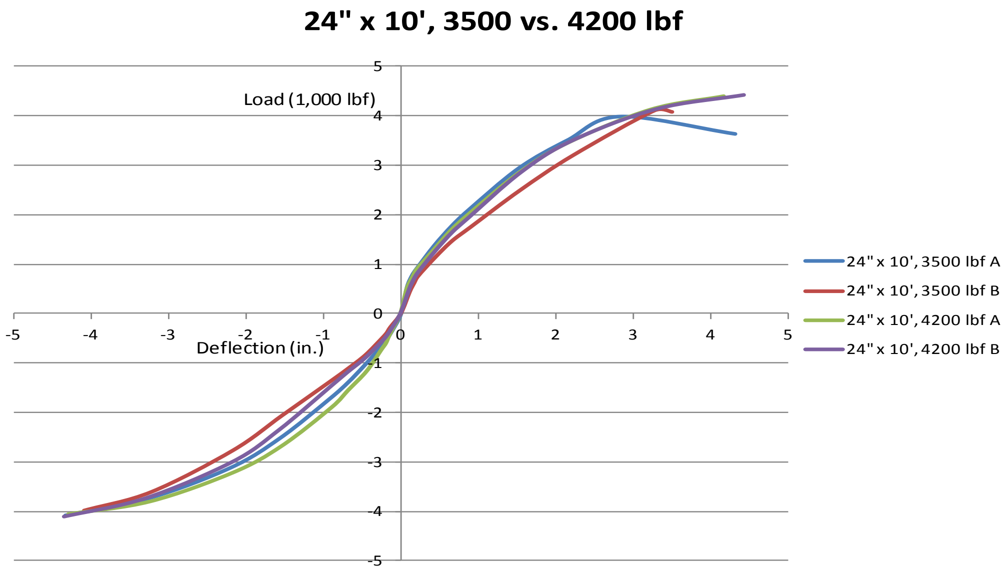
Reason: 1) There are a couple of types of changes to Figure 2308.9.3.2 proposed. There are both technical changes and editorial changes.

Technical changes: The two technical changes made to the figure are the reduction of the capacity of the portal frame leg tie-down devices from 4200 lbf to 3500 lbf and the removal of the third bottom plate at the portal frame leg. (Note that the third bottom plate we propose to delete is NOT shown in the figure above. The normal strikethrough and underline procedures are difficult to apply to figure changes.)

A. The first technical change is the reduction of the tie-down from 4200 lbf to 3500 lbf. The initial testing was conducted on the portal frames utilizing the 4200 lbf hold down because that was what was readily available and in common use by the construction industry. At the time of initial testing, no attempt was made to determine the sensitivity of the system to such a reduction in tie-down capacity. As the initial prescriptive parameters of the portal frame were based on testing, there was no latitude for determining the impact of the industry wide reduction to such tie-downs in response to the cracked-concrete provisions of ACI 318. As such, retesting of the portal frames with both 4200 lbf and 3500 lbf tie-downs was necessary to determine the impact on the performance of the system, if any. Portals with 16" wide legs x 8 ft height as well as 24" wide x 10 ft high were recently retested by APA. Pairs of each size were tested with 4200 lbf tie-downs and then retested with 3500 lbf tie-downs. The results of these tests showed that the system was relatively insensitive to the reduction in tie-down capacity from 4200 lbf to 3500 lbf. No attempt was made to determine how low the tie-down capacity could be reduced before an impact on the performance of the portal frames could be seen.

These tests were conducted using the CUREe method, as described in ASTM E2126, with a frequency of 0.5 Hz. The following charts show the backbone curves for the Method PFH portal frames tested with 3500 lbf and 4200 lbf tie-downs at both the 16" wide leg portals 8' high as well as the 24" wide portals 10' high.





Free PDF Copies of the full lab report on this testing program entitled APA Report T2011-15, *Bracing Method PFH (Portal Frame with Hold down) – Alternative Attachment,* can be obtained at http://www.apawood.org.

B. The second technical change is the removal of the third bottom plate. As mentioned above the original testing was conducted with the third plate in place. The third plate causes numerous difficulties in the field, not the least of which is that the normal length threaded anchors are too short to accommodate the third plate and provide the required depth of penetration into the foundation. This results in inadequate anchor depth-of-embedment or the use of threaded sleeves and all-thread to extend the bolt length to accommodate the third plate. When investigating the change to the 3500 lbf hold down, we utilized this opportunity to run the tests with only double bottom plates. All subsequent testing was done without the third bottom plate. The results of this testing indicated that the third bottom plate has negligible impact on the performance of the portal frames.

<u>Non-technical changes:</u>

1. The intent of the note concerning the location of the portal-leg sheathing-splice, when present, is to place the splice butt joint within the middle 24" of the portal frame height. As currently written "within 24" of mid height" means the splice could be placed within 24 inches either above or below of mid height, or within a band 48" wide. This was never the intent. The proposed language is clearer that the joint must "occur within the middle 24" of portal height", where portal height is illustrated in the figure.
2. At the splice plate, the current wording requires a single row of nailing. The proposed change required this at <u>each panel edge</u> at the splice as was the original intent.
3. In the same annotation, a provision is provided that would permit the splice to be made over a pair of 2x4s as long as they are spliced together. The proposal changes "blocking" to "double blocking" to clarify the intent.

2) The revision to Section 2308.9.3.2 is as explained above.

Cost Impact: The code change proposal will not increase the cost of construction.

S291-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

F2308.9.3.2-S-KEITH.doc

S292–12
2308.11.3.3

Proponent: Robert Rice, C.B.O., Josephine County, OR, representing Oregon Building Officials Association (structdesigner@yahoo.com), R. Terry Malone, P.E., S.E.

Revise as follows:

2308.11.3.3 Openings in horizontal diaphragms. Horizontal diaphragms with openings having dimension perpendicular to the joist that is greater than 4 feet (1219 mm) shall be designed in accordance with accepted engineering practice. Openings in horizontal diaphragms with a dimension perpendicular to the joist that is not greater than 4 feet (1219 mm) shall be constructed ~~in accordance with the following:~~ with metal ties and blocking in accordance with this section and Figure 2308.11.3.3.

1. ~~Blocking shall be provided beyond headers.~~
2. Metal ties shall not be less than 0.058 inch thick [1.47 mm (16 galvanized gage)] by 1 1/2 inches (38 mm) wide and shall have a minimum yield strength of 33,000 psi (227 MPa). Blocking shall extend 2 feet minimum beyond headers. Ties shall be attached to blocking with eight 16d common nails on each side of the header-joist intersection ~~shall be provided (see Figure 2308.11.3.3). The metal ties shall have a minimum yield of 33,000 psi (227 MPa)~~.

Reason: This proposal re-arranges the existing text to read more clearly, corrects an error in the code and clarifies the requirements and limitations of openings in diaphragms in structures assigned to Seismic Design Category B, C, D and E. The text of the current code is intended to provide a prescriptive solution for diaphragm openings, in high seismic design categories, that are 4 feet or less. The current code is missing the word "not" which would make this section correct. The commentary for this code section correctly states,

Horizontal diaphragms are floor and roof assemblies that are usually clad with structural wood sheathing panels, such as plywood or OSB. Though more complicated and difficult to visualize, lateral forces that are applied to a building from wind or seismic events follow a load path that distributes and transfers shear and overturning forces from the lateral loads. When openings are built into the diaphragm, they disrupt the continuity of load across the diaphragm and they must be reinforced to compensate. Another concern is the stiffness of the diaphragm. These provisions are a prescriptive solution for openings not greater than 4 feet (1219 mm) in dimension and provide a general means for a load path in these specific cases in lieu of an engineered design.- 2009 IBC Commentary, International Code Council

Cost Impact: The code change proposal will not increase the cost of construction.

S292-12

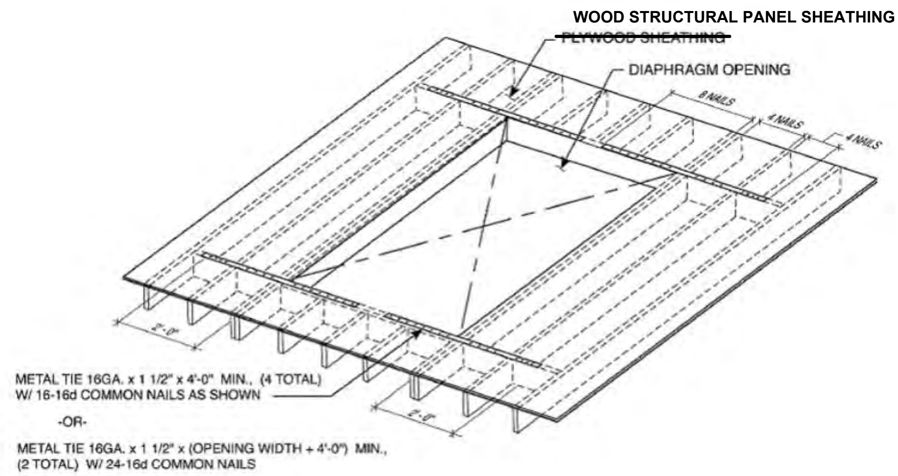
Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2308.11.3.3-S-RICE.doc

S293–12
Figure 2308.11.3.3

Proponent: Edward L. Keith, P.E., APA – The Engineered Wood Association (ed.keith@apawood.org)

Revise as follows:



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE 2308.11.3.3
OPENINGS IN HORIZONTAL DIAPHRAGMS

2012 INTERNATIONAL BUILDING CODE® 513

Reason: This is one of the last remaining references to "plywood" in the code that should have been converted to the more generic "wood structural panel" (WSP) in the 2000 first printing of the IBC. In terms of structural capacity, the IBC makes no distinction to the type of wood structural panel sheathing used. In addition, the type of floor sheathing is inconsequence to the subject of the figure, which relates to floor framing. We request approval of the code change proposal for the sake of consistency in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

S293-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

F2308.11.3.3-S-KEITH.doc

S294–12

1504.2.1.1 (NEW), 1504.2.1.2 (NEW), 1711.1, 1711.1.1, 1711.1.2, 1711.1.2.1, 1711.1.3, 1711.2, 1711.2.1, 1711.2.2, 2309 (NEW)

Proponent: D. Kirk Harman, P.E., S.E., SECB, FACI, The Harman Group, Inc., National Council of Structural Engineering Association

Revise as follows:

~~SECTION 1711~~
~~MATERIAL AND TEST STANDARDS~~

SECTION 2409
JOIST HANGERS

~~1711.1~~ 2309 Joist hangers. Testing of joist hangers shall be in accordance with Sections 1711.1.1 through 1711.1.3, as applicable.

~~1711.1.1~~ 2309.1 General. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

1711.1.2 2309.2 Vertical load capacity for joist hangers. The vertical load-bearing capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load-bearing of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).
2. The average ultimate vertical load for a single hanger from all tests divided.by three (where six or more tests are conducted)
3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 1/8 inch (3.2 mm).
4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.
5. The allowable design load for the wood members forming the connection.

~~1711.1.2.1~~ 2309.2.1 Design value modifications for joist hangers. Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1711.1.2 shall be permitted to be modified by the appropriate load duration factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1711.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1711.1.2 shall not be modified by load duration factors.

~~1711.1.3~~ 2309.3 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 1/8 inch (3.2 mm).

~~**1711.2 Concrete and clay roof tiles**~~ **1504.2.1 Testing.** Testing of concrete and clay roof tiles shall be in accordance with ~~Sections 1711.2.1 and 1711.2.2, as applicable.~~ this section.

~~**1711.2.1**~~ **1504.2.1.1 Overturning resistance.** Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with SBCCI SSTD 11 and Chapter 15.

~~**1711.2.2**~~ **1504.2.1.2 Wind tunnel testing.** Where concrete and clay roof tiles do not satisfy the limitations in Chapter 16 for rigid tile, a wind tunnel test shall be used to determine the wind characteristics of the concrete or clay tile roof covering in accordance with SBCCI SSTD 11 and Chapter 15.

Reason: Chapter 17 is titled “Special Inspections and Tests” and as such, is intended to be primarily reserved for the special inspection and testing associated with the actual construction work. NCSEA holds the opinion that material compliance testing for joist hangers belongs in Chapter 23 as this testing is not associated with the actual construction work. Similarly, wind tunnel testing to determine overturning resistance of roof tiles belongs in Chapter 15 as these tests are also not associated with the actual construction work and an existing section dealing with wind resistance for concrete and clay roof tiles currently exists as section 1502.1. Current Section 1711 is comprised solely of the two sections proposed to be relocated, and can therefore be deleted subsequent to the relocations.

Cost Impact: The code change proposal will not increase the cost of construction.

S294-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2309 (NEW)-S-HARMAN.doc

S295–12

2404.1, 2404.2, 2404.3.1, 2404.3.2, 2404.3.3, 2404.3.4, 2404.3.5, 2405.5.2

Proponent: Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturers Association (julruth@aol.com)

Revise as follows:

2404.1 Vertical glass. Glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind loads due to ultimate design wind speed V_{ult} in Section 1609 for components and cladding. Glass in glazed curtain walls, glazed storefronts and glazed partitions shall meet the seismic requirements of ASCE 7, Section 13.5.9. The load resistance of glass under uniform load shall be determined in accordance with ASTM E 1300.

The design of vertical glazing shall be based on the following equation:

$\underline{0.6}F_{gw} \le F_{ga}$ **(Equation 24-1)**

where:

F_{gw} = Wind load on the glass due to ultimate design wind speed V_{ult}~~,~~ computed in accordance with Section 1609.

F_{ga} = Short duration load on the glass as determined in accordance with ASTM E 1300.

2404.2 Sloped glass. Glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunrooms, sloped roofs and other exterior applications shall be designed to resist the most critical of the following combinations of loads.

$F_g = \underline{0.6}Wo - D$ **(Equation 24-2)**

$F_g = \underline{0.6}W_i + D + 0.5\ S$ **(Equation 24-3)**

$F_g = \cancel{0.5}\ \underline{0.3}W_i + D + S$ **(Equation 24-4)**

where:

D = Glass dead load psf (kN/m2).

For glass sloped 30 degrees (0.52 rad) or less from horizontal,

= 13 t_g (For SI: 0.0245 tg).

For glass sloped more than 30 degrees (0.52 rad) from horizontal,

= 13 t_g cos θ (For SI: 0.0245 tg cos θ).

F_g = Total load, psf (kN/m2) on glass.

S = Snow load, psf (kN/m2) as determined in Section 1608.

t_g = Total glass thickness, inches (mm) of glass panes and plies.

W_i = Inward wind force, psf (kN/m2) due to ultimate design wind speed V_{ult} as calculated in Section 1609.

W_o = Outward wind force, psf (kN/m2) due to ultimate design wind speed V_{ult}~~,~~ as calculated in Section 1609.

θ = Angle of slope from horizontal.

Exception: Unit skylights shall be designed in accordance with Section 2405.5.

The design of sloped glazing shall be based on the following equation:

$F_g \le F_{ga}$ **(Equation 24-5)**

where:

F_g = Total load on the glass determined from the load combinations above.
F_{ga} = Short duration load resistance of the glass as determined according to ASTM E 1300 for Equations 24-2 and 24-3; or the long duration load resistance of the glass as determined according to ASTM E 1300 for Equation 24-4.

2404.3.1 Vertical wired glass. Wired glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind loads in Section 1609 for components and cladding according to the following equation:

$\underline{0.6}F_{gw} < 0.5\ F_{ge}$ **(Equation 24-6)**

where:

F_{gw} = Is the wind load on the glass due to ultimate design wind speed V_{ult}, computed per Section 1609.
F_{ge} = Nonfactored load from ASTM E 1300 using a thickness designation for monolithic glass that is not greater than the thickness of wired glass.

2404.3.2 Sloped wired glass. Wired glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunspaces, sloped roofs and other exterior applications shall be designed to resist the most critical of the combinations of loads from Section 2404.2.

For Equations 24-2 and 24-3:

$F_g < 0.5\ F_{ge}$ **(Equation 24-7)**

For Equation 24-4:

$F_g < 0.3\ F_{ge}$ **(Equation 24-8)**

where:

F_g = Total load on the glass, as determined by equations 24-2, 24-3 or 24-4.
F_{ge} = Nonfactored load from ASTM E 1300.

2404.3.3 Vertical patterned glass. Patterned glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind loads in Section 1609 for components and cladding according to the following equation:

$F_{gw} < 1.0\ F_{ge}$ **(Equation 24-9)**

where:

F_{gw} = Wind load on the glass due to ultimate design wind speed V_{ult} computed per Section 1609.
F_{ge} = Nonfactored load from ASTM E 1300. The value for patterned glass shall be based on the thinnest part of the glass. Interpolation between nonfactored load charts in ASTM E 1300 shall be permitted.

2404.3.4 Sloped patterned glass. Patterned glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunspaces, sloped roofs and other exterior applications shall be designed to resist the most critical of the combinations of loads from Section 2404.2.

For Equations 24-2 and 24-3:

$F_g < 1.0\ F_{ge}$ **(Equation 24-10)**

For Equation 24-4:

$F_g < 0.6F_{ge}$ **(Equation 24-11)**

Where

F_g = Total load on the glass, as determined by equations 24-2, 24-3 or 24-4.
F_{ge} = Nonfactored load from ASTM E 1300. The value for patterned glass shall be based on the thinnest part of the glass. Interpolation between the nonfactored load charts in ASTM E 1300 shall be permitted.

2404.3.5 Vertical sandblasted glass. Sandblasted glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors, and other exterior applications shall be designed to resist the wind loads in Section 1609 for components and cladding according to the following equation:

$\cancel{Fg}\,0.6F_{gw} < 0.5\ F_{ge}$ **(Equation 24-12)**

where:

$\cancel{F_g}$ F_{gw} = ~~Total~~ Wind load on the glass due to ultimate design wind speed V_{ult} computed per Section 1609.
F_{ge} = Nonfactored load from ASTM E 1300. The value for sandblasted glass is for moderate levels Of sandblasting.

2405.5.2 Unit skylights rated for separate performance grades for positive and negative design pressure. The design of unit skylights rated for performance grade for both positive and negative design pressures shall be based on the following equations:

$F_{gi} \leq PG_{Po}$ **(Equation 24-14)**
$F_{go} \leq PG_{Ne}$ **(Equation 24-15)**

where:

PG_{Pos} = Performance grade rating of the skylight under positive design pressure;
PG_{Neg} = Performance grade rating of the skylight under negative design pressure; and

F_{gi} and F_{go} are determined in accordance with the following:

For $0.6W_o \geq D$,

where:

W_o = Outward wind force, psf (kN/m2) due to ultimate design wind speed V_{ult}, as calculated in Section 1609.
D = The dead weight of the glazing, psf (kN/m2) as determined in Section 2404.2 for glass, or by the weight of the plastic, psf (kN/m2) for plastic glazing.
F_{gi} = Maximum load on the skylight determined from Equations 24-3 and 24-4 in Section 2404.2.
F_{go} = Maximum load on the skylight determined from Equation 24-2.

For $0.6W_o < D$, where:

W_o = Is the outward wind force, psf (kN/m2) due to ultimate design wind speed V_{ult} as calculated in Section 1609.
D = The dead weight of the glazing, psf (kN/m2) as determined in Section 2404.2 for glass, or by the weight of the plastic for plastic glazing.

F_{gi} = Maximum load on the skylight determined from Equations 24-2 through 24-4 in Section 2404.2.
F_{go} = 0.

Reason: The purpose of this proposal is to coordinate the glass design load equations of Chapter 24 with those of Chapter 16.

The design load equations of Chapter 16 of the 2012 IBC were revised as appropriate to respond to the change of design wind load model from Allowable Stress Design to Strength Design in ASCE 7-10. These revisions, however, were not carried back to the glass design load equations of Chapter 24.

This proposal corrects this previous omission.

Cost Impact: The code change proposal will not increase the cost of construction.

S295-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2404.1-S-RUTH.doc

S296–12
2406.4.5

Proponent: Jennifer Hatfield, J. Hatfield & Associates, PL, representing Association of Pool & Spa Professions (jen@jhatfieldandassociates.com)

Revise as follows:

2406.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing ~~hot tubs, spas, whirlpools~~ aquatic vessels, saunas, steam rooms, bathtubs, and showers ~~and indoor or outdoor swimming pools~~ where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface shall be considered a hazardous location. This shall apply to single glazing and all panes in multiple glazing.

> **Exception:** Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub~~, hot tub, spa, whirlpool, or swimming pool~~ or aquatic vessel.

Reason: The new International Swimming Pool & Spa Code (ISPSC) utilizes a new definition to encompass all different types of pools, hot tubs, and spas – aquatic vessel. This proposal utilizes the new terminology found in the ISPSC for consistency between the I-codes.

Cost Impact: The code change proposal will not increase the cost of construction.

S296-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2406.4.5-S-HATFIELD.doc

S297–12
2406.4.7

Proponent: Tim Pate, City & County of Broomfield Building Division, representing Colorado Chapter Code Change Committee

Revise as follows:

2406.4.7 Glazing adjacent to the bottom stair landing. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than ~~36 inches (914 mm)~~ 60 inches (1524 mm) above the landing and within 60 inches (1524 mm) horizontally of the bottom tread shall be considered a hazardous location.

> **Exception:** Glazing that is protected by a guard complying with Sections 1013 and 1607.8 where the plane of the glass is greater than 18 inches (457 mm) from the guard.

Reason: Previous editions of the IBC before the 2012 required glazing that is less than 60" above the landing to be approved safety glazing. It is not clear why this requirement was changed in the 2012. It does not make sense that section 2406.4.6 applies to glazing that is less than 60" above the stairs and intermediate landings but the glazing at bottom landing is treated differently – only when below 36" The potential for falling through the glazing at bottom landing is the same. This change will bring back the 60" height which will then match the requirement at intermediate landings and stairs.

Cost Impact: The code change proposal will increase the cost of construction.

S297-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2406.4#1-S-PATE.doc

S298–12
2406.4.7

Proponent: Tim Pate, City & County of Broomfield Building Division, representing self

Revise as follows:

2406.4.7 Glazing adjacent to the bottom stair landing. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within a 60 inches (1524 mm) horizontally of arc less than 180 degrees from the bottom tread shall be considered a hazardous location.

> **Exception:** Glazing that is protected by a guard complying with Sections 1013 and 1607.8 where the plane of the glass is greater than 18 inches (457 mm) from the guard.

Reason: Previous editions of the IBC before the 2012 required glazing that is 60” horizontally in any direction to be approved safety glazing. It is not clear why this requirement was changed in the 2012. The previous editions had the additional wording “in any direction” when applying the 60” horizontal rule. This is due to the “splay” factor for when someone gets to the last tread and falls. The tendency is for someone to flail out in any direction. This added wording will make this section apply to any glazing that is in a wall that is less than 180 degrees from the bottom tread. This will make it very clear what the intent was and still is with this section.

Cost Impact: The code change proposal will increase the cost of construction.

S298-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2406.4.7#2-S-PATE.doc

S299–12
2407.1.2

Proponent: Anthony Leto, The Wagner Companies

Revise as follows:

2407.1.2 Support. Each handrail or *guard* section shall be supported by a minimum of three glass balusters or shall be otherwise supported to remain in place should one baluster panel fail. Glass balusters shall not be installed without an attached ~~handrail or *guard*~~ top rail.

> **Exception:** A top rail shall not be required where the glass balusters are laminated glass with two or more glass plies of equal thickness and the same glass type when *approved* by the *building official*. The panels shall be designed to withstand the loads specified in Section 1607.8.

Reason: While the ICC opinion on top railing requirements for monolithic glass baluster guards has remained consistent, we continue to see installations without the required top rail. Where is the disconnect?

The confusion begins with *IBC Section 2407.1.1.2 Support*. There are three issues:

1. **The term *guard* is used improperly at the end of the second sentence.**
   The ICC defines *guard* as being in place to stop accidental falls and refers to the full assembly not the guard top. The word *guard* should be replaced with the words *top rail* as is noted in the *Exception*.
2. **In a glass baluster handrail, the handrail and top rail are the same component.**
   A glass baluster being used only as a handrail (i.e. a stair where there is less than a 30 inch drop from the top step) will require a handrail which must meet the dimensional and clearance requirements for handrail. It should be noted, that under the strict definition of handrail clearance, a handrail placed directly on top of a glass baluster does not meet code as the glass would be considered a 100% obstruction. The handrail would need to be attached to the glass baluster with brackets to provide code compliant clearance. The handrail would be the top most portion of the assembly, therefore the handrail would also serve as the top rail.
3. **Misinterpretation of the phrase, *Glass balusters shall not be installed without an attached handrail or guard.***
   Handrail is required on stairs and is located 34 to 38 inches above the stair nosing. A guard is required when there is a 30 inch drop. The IBC minimum for a guard is 42 inches above the walking surace. If a stair has a drop of greater than 30 inches, it would be required to have both a handrail and a guard. However, if the stair height does not exceed 30 inches, only a handrail is required.
   There are some who interpret that *Section 2407.1.1.2* allows a glass baluster guard to be installed with *either* a handrail or a guard (top rail).

   However, the section's intention is that a glass baluster *handrail* must have an attached *handrail* and that a glass baluster *guard* must have an attached *guard* (top rail). **The presence of a *handrail* on a *guard* does not eliminate the need for a top railing.** This interpretation is supported by:

   A. **The ICC**
   In 2008, Todd Daniel of the National Ornamental and Miscellaneous Metals Association (NOMMA) asked the following question of the International Code Council (ICC):

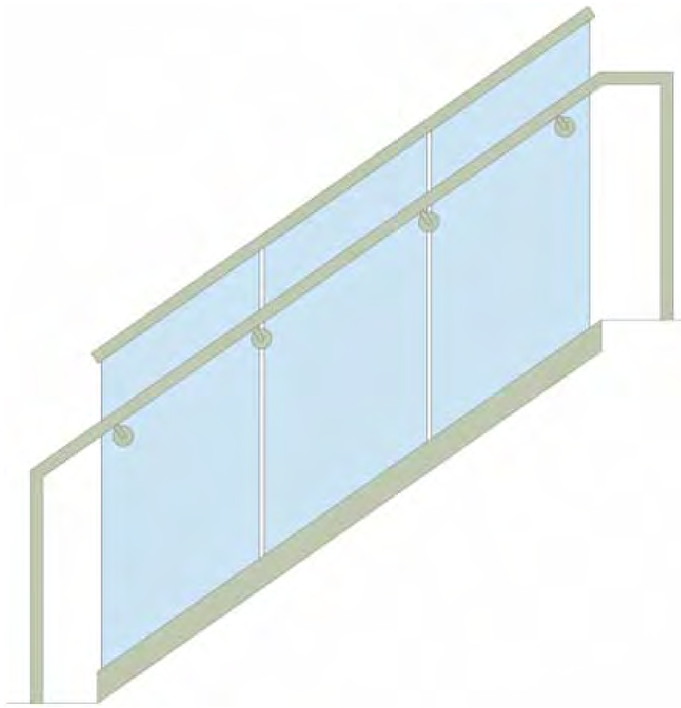
   Can a glass rail system be installed without a guard on top of the glass IF there is a handrail attached to the glass. In other words...no cap, exposed top edge of glass at 42 inch height with a handrail mounted on the side of the glass at handrail heights.
   ICC Staff Opinion: No
   Reason: The application you describe can only be allowed if the glass can withstand the loads for guards and handrails in Section 1607.7

   B. **The 2009 IBC Exception**
   The ICC approved an exception in 2009 that a top railing was not required if laminated glass is used that meets the load requirements and is approved by the building official. If this is the exception to the rule, then it should be understood that a top railing is required in all other situations.

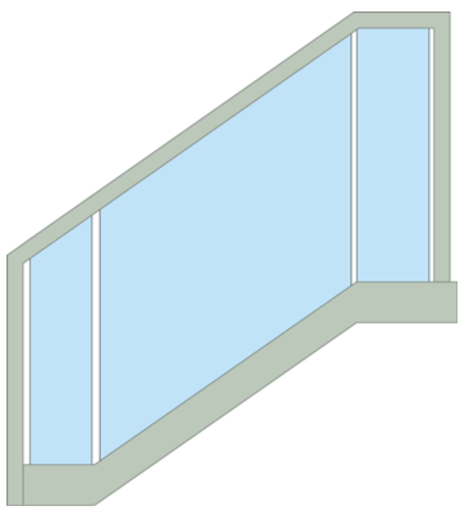
   C. **The Load Requirements**
   Section 2407.1.1 requires that glass baluster handrails and guards must meet the load requirements of 1607.7 with a safety factor of four.
   In a required guard, the loads must be applied to the *top* of the guard -- not the top of the handrail. Having a 42 inch guard with an attached handrail at between 34 and 38 inches will not meet the load requirement unless it is laminated tempered glass or the monolithic, tempered glass is of significant thickness.

   Standard 1/2 inch monolithic, tempered glass edges are highly susceptable to rupture under load. Directing an 800 pound concentrated load (200 lbs multiplied by a safety factor of four) to that bare edge will most likely result in failure.

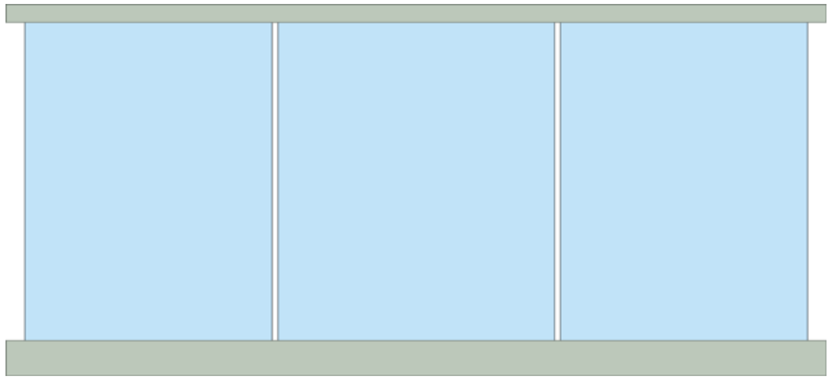
In 2011, there were numerous cases of glass railing failures across the US and Canada. An article relating these failuures was published this past October by US Glass Magazine (http://www.usglassmag.com/digital/2011/Oct2011.pdf). While most cases were likely the result of nickel sulfide inclusions in the glass, the consulting engineering firm brought in to determine the reasons for failure of glass railings at the W Hotel in Austin, TX noted that in one event, the failure was related to debris from above striking a bare edge of a glass panel.



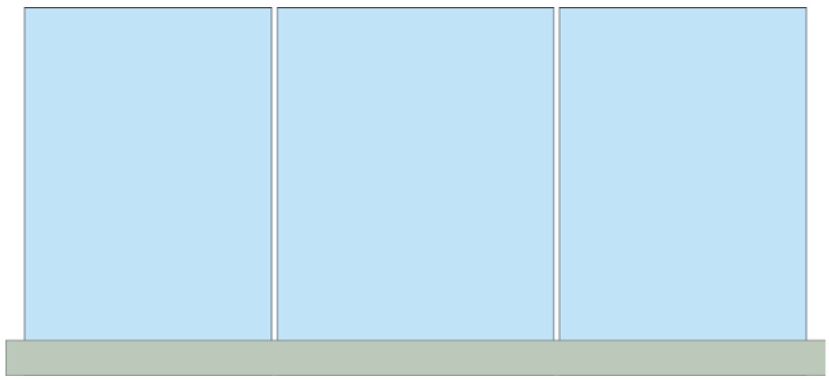
Stair with required guard and attached handrail.



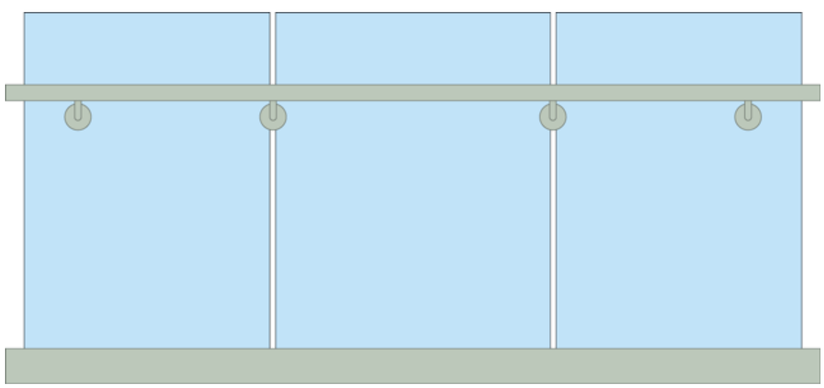
Required handrail for stair when a guard is not required.



Guard with top railing



Guard without top railing. Per ICC staff opinion, permitted only when used with laminated, tempered glass or if the glass meets the structural requirements of 1607.7



Guard with non-required handrail -- handrail is in place in an attempt to meet the requirements of an attached handrail or guard. However, the requirement is that the guard be able to withstand the load at the top of the guard. The handrail is not the top of the guard therefore the load must be met by the top edge of glass -- by a safety factor of four.

Cost Impact: There should be no cost impact since this change is to clarify and eliminate misinterpretation whereby glass railings are being installed without a top rail. In reality there will be long term savings as there are now situations where, as part of due diligence during a building purchase, consulting engineers are pointing out that glass rails without a top rail are not code compliant. Building owners in turn are requiring engineers/architects of record to have the railing redesigned to be code compliant.

S299-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2407.1.2-S-LETO.doc

S300–12
2407.1, 2407.1.1

Proponent: Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee (tzaremba@ralaw.com)

Revise as follows:

2407.1 Materials. Glass used ~~as~~ in a handrail ~~assembly~~ , guardrail or a *guard* section shall be laminated glass constructed of ~~either single fully tempered glass, laminated~~ fully tempered glass or ~~laminated~~ heat-strengthened glass and shall comply with Category II of CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1. Glazing in railing in-fill panels shall be of an *approved* safety glazing material that conforms to the provisions of Section 2406.1.1. For all glazing types, the minimum nominal thickness shall be 1/4 inch (6.4 mm). ~~Fully tempered glass and laminated glass shall comply with Category II of CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1.~~

> **Exception:** Single fully tempered glass complying with Category II of CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1 may be used in handrails and guardrails if there is no walking surface beneath them or the walking surface is permanently protected from the risk of falling glass.

2407.1.1 Loads. The panels and their support system shall be designed to withstand the loads specified in Section 1607.8. A ~~safety~~ design factor of four shall be used for safety.

Reason: Several recent incidents involving spontaneous breakage of fully tempered glass in handrail or guardrail systems on high rise balconies has prompted the Glazing Industry Code Committee to seek this change which, if adopted, will make mandatory the use of the retentive characteristics of laminated glass in these applications unless there is no walking surface below or it is permanently protected from falling glass, in which case, fully tempered glass meeting the safety criteria of Cat. II of CPSC 16 CFR 1201 or Class A of ANSI Z97.1 would be permitted. Additionally, the proposal adds the term “guardrail” to section 2407.1 since that term is also used in various locations throughout the I-codes in connection with these types of systems.

Finally, proposal changes Section 2407.1.1 are intended to make it clear that a “design” factor of four is required “for safety.” The intent of this section is to use a “design” factor of four when determining the loads of these panels and their support systems. Using the word “safety” in the way it is currently found in this section is ambiguous and may or may not achieve the section’s intended purpose.

Cost Impact: The code change proposal will increase the cost of construction.

S300-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2407.1-S-ZAREMBA.doc

S301–12
2409, 2409.1 (NEW), Chapter 35 (NEW)

Proponent: Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee (tzaremba@ralaw.com)

Revise as follows:

SECTION 2409
GLASS IN WALKWAYS, ELEVATOR HOISTWAYS AND ELEVATOR CARS

2409.1 Glass walkways. Glass installed as a part of a floor/ceiling assembly as a walking surface and constructed with laminated glass shall comply with ASTM E 2751-11, otherwise it shall comply with the load requirements specified in Chapter 16. Such assemblies shall also comply with the fire-resistance rating requirements of this code where applicable.

Add new standard to Chapter 35 as follows:

ASTM

E 2751 Standard Practice for Design and Performance of Supported Glass Walkways

Reason: : In the development cycle leading to the 2006 IBC, the Glazing Industry Code Committee ("GICC") asked this body to delete the glass walkway provisions found in Chapter 24 of the 2003 IBC. The reason for its request was that the glass walkway provisions found in the 2003 IBC used load requirements derived from ASTM E1300 and glass walkways are not within the scope of ASTM E1300. As a result, the glass walkway provisions of Chapter 24 were deleted from the 2006 IBC.

Since then, ASTM E2751-11 has been issued and specifically addresses load-bearing glass walkways constructed of laminated glass. If adopted, this new section 2409.1 would apply to glass walkways constructed of laminated glass, otherwise the load requirements of Chapter 16 would apply to glass walkways constructed of non-laminated glass, for example, walkways constructed using glass block.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S301-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2409.1 (NEW)-S-ZAREMBA.doc

S302–12
202 (NEW), 1710.6, 2410 (NEW), 2410.1 (NEW), 2410.2 (NEW)

Proponent: Timothy Burgos, InterCode Incorporated, representing 3M Company

Add new text as follows:

SECTION 202
DEFINITIONS

SUNLIGHT DELIVERY SYSTEM (SDS). A unit primarily designed to transmit daylight from an exterior surface to an interior space via a reflective duct or conduit. The basic unit consists of an exterior solar collecting device, a daylight-transmitting duct or conduit with a reflective interior surface, and an interior-ceiling device such as a translucent ceiling panel. The unit can be factory assembled, or field-assembled from a manufactured kit.

Revise as follows:

1710.6 Skylights ~~and~~ sloped glazing, and sunlight delivery systems. Unit skylights ~~and tubular daylighting devices (TDDs)~~ shall comply with the requirements of Section 2405. Sunlight delivery systems (SDS's) and tubular daylighting devices (TDDs) shall comply with the requirements of Section 2410. All other skylights and sloped glazing shall comply with the requirements of Chapter 24.

Add new text as follows:

SECTION 2410
SUNLIGHT DELIVERY SYSTEMS AND TUBULAR DAYLIGHTING DEVICES

2410.1 General. Sunlight delivery systems and tubular daylighting devices shall comply with the requirements of this code and be installed per the manufacturer's specifications.

2410.2 Definition. The following terms are defined in Chapter 2:

SUNLIGHT DELIVERY SYSTEM.

TUBULAR DAYLIGHTING DEVICE.

Reason: The purpose of this proposed edit is to create a more expansive definition of the tubular daylighting device. While tubular daylighting devices are a common implementation of the principles of reflective daylighting, new advancements in the field are available worldwide and should be included in the next edition of the International Building Code. Having a more expansive definition in the International Building Code for sunlight delivery systems will open up new technologies that can introduce natural sunlight into the interior areas that do not have windows or natural light entering that room. A sunlight delivery system provides designers with a new method of daylighting that offers significantly greater capabilities than existing alternatives. Traditional daylighting methods, such as skylights or tubular daylighting devices, are limited. These systems can require multiple entry points and are often limited to top floor applications. An example of a sunlight delivery system can be found in the pictures at the end of this reason statement.

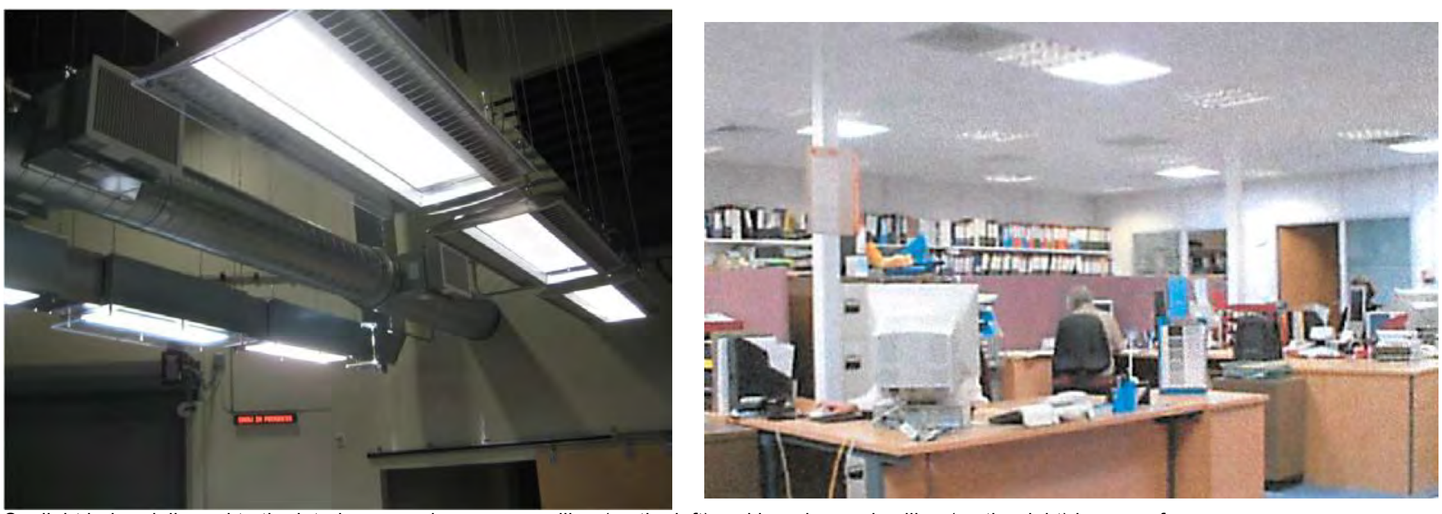
The widespread use of electrical lighting in the 20th century changed the design of buildings but often made it impossible to illuminate internal rooms with daylight, thus requiring the use of artificial light in internal spaces. The use of artificial light currently makes up as much as 45% of the energy use in commercial and industrial buildings and up to 35% in residential buildings.

Sunlight delivery systems can significantly reduce energy costs for illumination. In a paper presented to LuxEuropa in 2009 entitled *Hybrid Lighting systems: a feasibility study for Europe* by Mohammed S. Mayhoub and David Carter, energy savings ranging from 28% to 85% (in latitudes ranging from 60^0 North (Oslo, Norway) to 36^0 North (Khania, Greece) were reported when a variety of sunlight delivery systems were tested. These locations correlate to locations in the United States as follows: Oslo, Norway is similar in latitude to Juneau and Anchorage, AK and Khania, Greece is similar to Virginia Beach, VA; Las Vegas, NV; and Nashville, TN.

The study showed that the greatest savings were realized in the Southern most latitudes (in the Northern Hemisphere) but still showed the possibility that 50% savings could be realized at 60^0 North with the most advanced systems. Because the study was limited to European Union countries, no analysis was conducted in more southern latitudes similar to the southernmost portion of the United States where cities such as Tampa, San Antonio, and New Orleans are located. In fact, most of the land mass of the contiguous 48 United States lies well below 50^0 North indicating that greater savings could be realized in the United States than those projected in Europe.

An abundance of research and knowledge shows not only that the preferred light source in buildings is natural daylight but also that lack of exposure to daylight can lead to biological issues, lack of productivity, higher levels of stress, sleep difficulties and a variety of other human response issues. Studies suggest that creating healthy indoor lighting by providing day-lighting and natural lighting cycles can be a simple form of preventative medicine and can lead to higher production and overall better mental and physical health for the inhabitants. The health benefits that a sunlight delivery device provides is one of the reasons for this code change to be approved.

Roof top solar collecting devices used in a sunlight delivery system.



Sunlight being delivered to the interior space in an open ceiling (on the left) and in a dropped ceiling (on the right) by way of a sunlight duct system.

Cost Impact: The code change proposal will not increase the cost of construction.

S302-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-SDS-S-BURGOS

S303–12
202, 1710.6, 2410 (NEW), 2410.1 (NEW), 2410.2 (NEW)

Proponent: Timothy Burgos, InterCode Incorporated, representing 3M Company

Revise as follows:

SECTION 202
DEFINITIONS

~~**TUBULAR DAYLIGHTING DEVICE (TDD)**~~ **SUNLIGHT DELIVERY SYSTEM (SDS)** **.** A ~~nonoperable fenestration~~ unit primarily designed to transmit daylight from ~~a roof~~ exterior surface to an interior ~~ceiling~~ space via a ~~tubular~~ reflective duct or conduit. The basic unit consists of an exterior ~~glazed weathering surface,~~ solar collecting device a daylight-transmitting ~~tube~~ duct or conduit with a reflective interior surface, and an interior ~~sealing~~ ceiling device such as a translucent ceiling panel. The unit can be factory assembled, or field assembled from a manufactured kit.

Revise as follows:

1710.6 Skylights ~~and~~ sloped glazing, and sunlight delivery systems . Unit skylights ~~and tubular daylighting devices (TDDs)~~ shall comply with the requirements of Section 2405. Sunlight delivery systems (SDS's) shall comply with the requirements of Section 2410. All other skylights and sloped glazing shall comply with the requirements of Chapter 24.

Add new text as follows:

SECTION 2410
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SUNLIGHT DELIVERY SYSTEM.

Reason: The purpose of this proposed edit is to create a more expansive definition of the tubular daylighting device. While tubular daylighting devices are a common implementation of the principles of reflective daylighting, new advancements in the field are available worldwide and should be included in the next edition of the International Building Code. Having a more expansive definition in the International Building Code for sunlight delivery systems will open up new technologies that can introduce natural sunlight into the interior areas that do not have windows or natural light entering that room. A sunlight delivery system provides designers with a new method of daylighting that offers significantly greater capabilities than existing alternatives. Traditional daylighting methods, such as skylights or tubular daylighting devices, are limited. These systems can require multiple entry points and are often limited to top floor applications. An example of a sunlight delivery system can be found in the pictures at the end of this reason statement.

The widespread use of electrical lighting in the 20th century changed the design of buildings but often made it impossible to illuminate internal rooms with daylight, thus requiring the use of artificial light in internal spaces. The use of artificial light currently makes up as much as 45% of the energy use in commercial and industrial buildings and up to 35% in residential buildings.

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An abundance of research and knowledge shows not only that the preferred light source in buildings is natural daylight but also that lack of exposure to daylight can lead to biological issues, lack of productivity, higher levels of stress, sleep difficulties and a variety of other human response issues. Studies suggest that creating healthy indoor lighting by providing day-lighting and natural lighting cycles can be a simple form of preventative medicine and can lead to higher production and overall better mental and physical health for the inhabitants. The health benefits that a sunlight delivery device provides is one of the reasons for this code change to be approved.

Roof top solar collecting devices used in a sunlight delivery system.

Sunlight being delivered to the interior space in an open ceiling (on the left) and in a dropped ceiling (on the right) by way of a sunlight duct system.

Cost Impact: The code change proposal will not increase the cost of construction.

S303-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-TDD-G-BURGOS

S304–12
[A]110.3.5, 202, 2501.1.1, 2502.1, 2503.1, 2504, 2505, 2506 and 2508

Proponent: Michael Gardner, Gypsum Association (mgardner@gypsum.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC ADMINISTRATION COMMITTEE. PART II WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE, AS TWO SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC ADMINISTATION

Revise as follows:

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

> **Exception:** Gypsum board and gypsum panel products that ~~is~~ are not part of a fire resistance- rated assembly or a shear assembly.

PART II – IBC STRUCTURAL

Revise as follows:

GYPSUM BOARD. The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing. Gypsum wallboard, gypsum sheathing, gypsum base for gypsum *veneer* plaster, exterior gypsum soffit board, predecorated gypsum board ~~or~~ and water-resistant gypsum backing board complying with the standards listed in Tables 2506.2, 2507.2 and Chapter 35 are types of gypsum board

Add new text as follows:

SECTION 202
DEFINITIONS

GYPSUM PANEL PRODUCT. The general name for a family of sheet products consisting essentially of gypsum.

Revise as follows:

CHAPTER 25
GYPSUM BOARD, GYPSUM PANEL PRODUCTS, AND PLASTER

2501.1.1 General. Provisions of this chapter shall govern the materials, design, construction and quality of gypsum board, gypsum panel products, lath, gypsum plaster and cement plaster.

2501.1.2 Performance. Lathing, plastering, ~~and~~ gypsum board, and gypsum panel product construction shall be done in the manner and with the materials specified in this chapter, and when required for fire protection, shall also comply with the provisions of Chapter 7.

2502.1 Definitions. For the purposes of this chapter and as used elsewhere in this code, the following terms are defined in Chapter 2:

GYPSUM PANEL PRODUCTS

2503.1 Inspection. Lath, ~~and~~ gypsum board, gypsum panel products shall be inspected in accordance with Section 110.3.5.

2504.1 Scope. The following requirements shall be met where construction involves gypsum board, gypsum panel products, or lath and plaster in vertical and horizontal assemblies.

2504.1.1 Wood framing. Wood supports for lath, ~~or~~ gypsum board, or gypsum panel products, as well as wood stripping or furring, shall not be less than 2 inches (51 mm) nominal thickness in the least dimension.

> **Exception:** The minimum nominal dimension of wood furring strips installed over solid backing shall not be less than 1 inch by 2 inches (25 mm by 51 mm).

2504.1.2 Studless partitions. The minimum thickness of vertically erected studless solid plaster partitions of 3/8- inch (9.5 mm) and 3/4-inch (19.1 mm) rib metal lath or 1/2- inch thick (12.7 mm) ~~long-length~~ gypsum lath, ~~and~~ gypsum board, or gypsum panel product partitions shall be 2 inches (51 mm).

2505.1 Resistance to shear (wood framing). Wood-framed shear walls sheathed with gypsum board, gypsum panel products, or lath and plaster shall be designed and constructed in accordance with Section 2306.3 and are permitted to resist wind and seismic loads. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7.

2505.2 Resistance to shear (steel framing). Cold-formed steel-framed shear walls sheathed with gypsum board or gypsum panel products, and constructed in accordance with the materials and provisions of Section 2211.6 are permitted to resist wind and seismic loads. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7.

SECTION 2506
GYPSUM BOARD AND GYPSUM PANEL PRODUCT MATERIALS

2506.1 General. Gypsum board, ~~materials~~ gypsum panel products, and accessories shall be identified by the manufacturer's designation to indicate compliance with the appropriate standards referenced in this section and stored to protect such materials from the weather.

2506.2 Standards. Gypsum board ~~materials~~ and gypsum panel products shall conform to the appropriate standards listed in Table 2506.2 and Chapter 35 and, where required for fire protection, shall conform to the provisions of Chapter 7.

2508.1 General. Gypsum board, gypsum panel product, and gypsum plaster construction shall be of the materials listed in Tables 2506.2 and 2507.2. These materials shall be assembled and installed in compliance with the appropriate standards listed in Tables 2508.1 and 2511.1.1, and Chapter 35.

TABLE 2508.1
INSTALLATION OF GYPSUM CONSTRUCTION

MATERIAL	STANDARD
Gypsum board and gypsum panel products	GA-216; ASTM C 840
Gypsum sheathing and gypsum panel products	ASTM C 1280
Gypsum veneer base	ASTM C 844
Interior lathing and furring	ASTM C 841
Steel framing for gypsum boards and gypsum panel products	ASTM C 754; C 1007

2508.3 Single-ply application. Edges and ends of gypsum boards and gypsum panel products shall occur on the framing members, except those edges and ends that are perpendicular to the framing members. Edges and ends of gypsum boards and gypsum panel products shall be in moderate contact except in concealed spaces where fire-resistance rated construction, shear resistance or diaphragm action is not required.

2508.4 Joint treatment. Gypsum board and gypsum panel product fire-resistance-rated assemblies shall have joints and fasteners treated.

Exception: Joint and fastener treatment need not be provided where any of the following conditions occur:

1. Where the gypsum board or the gypsum panel product is to receive a decorative finish such as wood paneling, battens, acoustical finishes or any similar application that would be equivalent to joint treatment.
2. On single-layer systems where joints occur over wood framing members.
3. Square edge or tongue-and-groove edge gypsum board (V-edge), gypsum panel product, gypsum backing board or gypsum sheathing.
4. On multilayer systems where the joints of adjacent layers are offset from one to another.
5. Assemblies tested without joint treatment.

2508.5 Horizontal gypsum board or gypsum panel product diaphragm ceilings. Gypsum board or gypsum panel products shall be permitted to be used on wood joists to create a horizontal diaphragm ceiling in accordance with Table 2508.5.

2508.5.2 Installation. Gypsum board or gypsum panel products used in a horizontal diaphragm ceiling shall be installed perpendicular to ceiling framing members. End joints of adjacent courses of gypsum board shall not occur on the same joist.

2508.5.3 Blocking of perimeter edges. All perimeter edges shall be blocked using a wood member not less than 2-inch by 6-inch (51 mm by 159 mm) nominal dimension. Blocking material shall be installed flat over the top plate of the wall to provide a nailing surface not less than 2 inches (51 mm) in width for the attachment of the gypsum board or gypsum panel product.

2508.5.4 Fasteners. Fasteners used for the attachment of gypsum board or gypsum panel products to a horizontal diaphragm ceiling shall be as defined in Table 2508.5. Fasteners shall be spaced not more than 7 inches (178 mm) on center (o.c.) at all supports, including perimeter blocking, and not more than 3/8 inch (9.5 mm) from the edges and ends of the gypsum board or gypsum panel product.

2508.5.5 Lateral force restrictions. Gypsum board or gypsum panel products shall not be used in diaphragm ceilings to resist lateral forces imposed by masonry or concrete construction.

TABLE 2508.5
SHEAR CAPACITY FOR HORIZONTAL WOOD FRAMED GYPSUM BOARD DIAPHRAGM CEILING ASSEMBLIES

MATERIAL	THICKNESS OF MATERIAL	SPACING OF FRAMING MEMBERS	SHEAR VALUE	MINIMUM FASTENER SIZE
Gypsum board or gypsum panel product	*No change*	*No change*	*No change*	*No change*
Gypsum board or gypsum panel product	*No change*	*No change*	*No change*	*No change*

(Portions of Table not shown remain unchanged)

Reason: This proposal inserts the term gypsum panel product in Chapter 25 where relevant. It also revises Section 110, which is referenced by Section 2503, adds a definition for gypsum panel products to Chapter 2, and revises the existing definition for gypsum board in Chapter 2.

Gypsum panel product is a term that was created by the gypsum manufacturing industry to describe gypsum sheet products that are manufactured unfaced or with a facing other than paper. Glass mat-faced and unfaced gypsum sheet materials are examples of gypsum panel products.

Some gypsum application standards referenced by the code, such as GA 216, ASTM C 840, and ASTM C 1280, are used to define application requirements for both board and panel products, a dual role that is not reflected in current code text. In addition, while the ASTM manufacturing standards for many gypsum panel products (ref. C 1278; C1178; C1658; C1177) were incorporated into Chapter 25 during the past decade, the general text of Chapter 25 was not updated to reflect the incorporation of the new standards. This proposal addresses both issues. It adds text to Table 2508.1 to indicate where the application standards may function as an application reference standard for either a board or a panel product, and it inserts the term gypsum panel product throughout the chapter where appropriate.

The definition for gypsum panel product proposed for Chapter 2 is extracted verbatim from ASTM International Standard C 11, *Standard Terminology Relating to Gypsum and Related Building Materials and Systems*.

The first sentence of the proposed revision to the current definition for gypsum board is extracted verbatim from the ASTM International Standard C 11 definition for gypsum board. The existing code text has been retained for clarity, notwithstanding a slight modification.

As a part of this proposal it is also suggested that the phrase “long length” should be removed from Section 2504.1.2. It appears to be extraneous text.

Following action on this proposal, other sections of the code requiring parallel modifications will be addressed in subsequent editions of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

S304-11

PART I – INTERNATIONAL BUILDING CODE- ADMINISTRATION

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

CH 25-S-GARDNER

S305–12
202, 2102.1 (NEW), 2502.1 (NEW)

Proponent: John Mulder, Intertek Testing Services NA, Inc., representing International Standards Organization Technical Committee 77, *Products in Fibre-reinforced Cement* and self

Revise as follows:

SECTION 202
DEFINITIONS

FIBER-CEMENT ~~SIDING~~ PRODUCTS. ~~A~~ Manufactured, ~~fiber-reinforcing product made with an inorganic hydraulic or calcium silicate binder formed by chemical reaction and reinforced with discrete organic or inorganic nonasbestos fibers, or both. Additives that enhance manufacturing or product performance are permitted.~~ thin section composites of hydraulic cementitious matrices and discrete non-asbestos fibers. Fiber-cement backer board products have either a smooth or textured face and are normally installed to wall or ceiling framing over which paint, wallpaper, resilient flooring, tile, natural stone or dimensioned stone *veneer* are applied. Fiber-cement underlayment products have either a smooth or textured face and are installed on a wood subfloor over which resilient flooring, tile, natural stone or dimensioned stone *veneer* are applied. Fiber-cement lap or panel siding, soffit, and trim products have either smooth or textured faces and are intended for *exterior wall* and related applications.

Add new text as follows:

2102.1 General. For the purposes of this chapter and as used elsewhere in this code, the following terms are defined in Chapter 2:

FIBER-CEMENT PRODUCTS

Add new text as follows:

2502.1 Definitions. The following terms are defined in Chapter 2:

FIBER-CEMENT PRODUCTS

Reason: The current definition is limited to fiber-cement siding products. The proposal corrects the definition to that published in ASTM C1154-06, *Standard Terminology for Non-Asbestos Fiber-reinforced Cement Products* (see attached copy of ASTM C1154-06), for "fiber-cement products". Additional text describes types of fiber-cement products to include also fiber-cement backer board, underlayment, soffit and trim products currently recognized in the Code (IBC Sections 1404.10, 1405.16, and 2509.2). The proposed code change eliminates a barrier to trade by including other fiber-cement products currently permitted by the Code.

A revision to Section 2103 (new Section 2103.15) is proposed to include "fiber-cement backer board and underlayment". The term "fiber-cement products" is proposed to be included in the definitions here consistent with the definition published in the Terminology Standard ASTM C1154-06, *Standard Terminology for Non-Asbestos Fiber-Reinforced Cement Products* (see attached Standard).

"Fiber-cement backer board is currently permitted for use in Section 2509.2. A new term is added to reference the permitted backer board material now defined in proposed new TABLE 2509.2, where all 3 permitted products are now listed and the proposed revision to Section 202 to include "fiber-cement products".

Cost Impact: The code change proposal will not increase the cost of construction because the change simply corrects the current definition to be consistent with the National Standard and provides examples of the types of products covered by the definition.

S305-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIBER-CEMENT SIDING-S-MULDER.doc

S306–12
Table 2507.2, Chapter 35 (New)

Proponent: James K. Hicks, P.E., CeraTech, Inc., representing self

Revise as follows:

TABLE 2507.2
LATH, PLASTERING MATERIALS AND ACCESSORIES

MATERIAL	STANDARD
Hydraulic Cement	ASTM C 1157; C1600

(Portions of table not shown remain unchanged)

Add new standard to Chapter 35 as follows:

ASTM

C 1157-11 Standard Performance Specification for Hydraulic Cement
C 1600-11 Standard Specification for Rapid Hardening Hydraulic Cement

Reason: ASTM C 1157 Cements:
ASTM C 1157 and C 1600 cements are "Green Cements" in deference to other cements that take substantial amounts of energy and use primarily virgin materials.

More flexibility is gained by use of any of ASTM C 1157 and C 1600 cements due to their incorporating recovered materials in much of their production. They can be made by using portland cement in combination with ground granulated blast furnace slag, natural pozzolans or up to 95% fly ash in their production. These cements contrast with cements manufactured from mostly virgin materials and require significant amounts of fuel and electrical energy for their production. The above standards allow in excess of the minimum amounts of recycled materials listed in Sections 503.2 and 503.3. Having the specifications listed allows the specifier information to readily access those standards and provides for better flexibility than language allowed in the IBC.

ASTM C 1157 cements with types GU— Hydraulic cement for general construction, Type HE—High Early-Strength, Type MS—Moderate Sulfate Resistance, Type HS—High Sulfate Resistance, Type MH—Moderate Heat of Hydration, Type LH—Low Heat of Hydration can be specified. They are general counterparts for ASTM C 150 Standard Specification for Portland Cement Type I, Type III, Type II, Type V and Type II with the low heat of hydration option.

C 1600 Cements:
In addition to the above characteristics, for those instances wherein rapid hardening is desired, cements conforming to ASTM C 1600 Standard Specification for Rapid hardening Hydraulic Cements should be useable. ASTM C 1600 can be one of four cement types, General Rapid Hardening (GRH), Moderate Rapid Hardening (MRH), Very Rapid Hardening (VRH) and Ultra Rapid Hardening (URH).

C 1600 is a Specification giving numerous performance requirements. Primary characteristics (with inherent increased design flexibility) are:

- Can produce rapid-hardening concrete, precast concrete, block, mortar and grout and is used in rapid hardening stuccos and plasters.
- Depending on the type cement used and the specific mixture, cements meeting ASTM C 1600 can provide either normal, medium or fast time to service (1.5 to 48 h)
- ASTM C 1600 has rigid durability requirements.

ASTM C 1600 cements are used in products such as:

- Materials for Concrete Repairs
- High Strength Grouts
- Precast
- Paving
- Some Cements - Mass Concrete
- Some Cements – Heat Resistant
- Some Cements – Chemical Resistant

Cost Impact: Economic cost of plaster utilizing C 1157 cements may be equal or slightly lower than portland cement concrete due to their sometimes lower process and additive costs. Environmental costs are generally lower with C 1157 cements as fuel use is generally less, costs of components may be less or with the case of activated fly ash based cements, no fuel is used and grinding is not required.

Economic cost of plaster utilizing C 1600 cements, while it may be approximately equal or higher when comparing cementitious to cementitious, is typically negligible for the concrete when considering the costs of other ingredients, transport, placement, finishing and curing.

Environmental costs are generally lower with C 1600 cements as fuel use is generally less, costs of components may be less or with the case of activated fly ash based cements, no fuel is used and grinding is not required.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S306-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

35-ASTM-S-HICKS.doc

S307–12
2509.2, Table 2509.2 (NEW), Chapter 35 (NEW)

Proponent: John Mulder, Intertek Testing Services NA, Inc. representing International Standards Organization Technical Committee 77, *Products in Fibre-reinforced cement* and self

Revise as follows:

2509.2 Base for tile. ~~Glass mat water-resistant gypsum backing panels, discrete nonasbestos fiber-cement interior substrate sheets or nonasbestos fiber-mat reinforced cementitious backer units in compliance with ASTM C 1178, C 1288 or C 1325 and installed in accordance with manufacturer recommendations shall be~~ Materials used as a base for wall tile in tub and shower areas and wall and ceiling panels in shower areas shall be of materials listed in Table 2509.2 and installed in accordance with manufacturer recommendations. Water-resistant gypsum backing board shall be used as a base for tile in water closet compartment walls when installed in accordance with GA-216 or ASTM C 840 and manufacturer recommendations. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas when installed in accordance with GA-216 or ASTM C 840.

TABLE 2509.2
BACKERBOARD MATERIALS

MATERIAL	STANDARD
Glass mat gypsum backing panel	ASTM C1178
Nonasbestos fiber-cement backer board	ASTM C1288 or ISO 8336
Nonasbestos fiber mat reinforced cementitious backer unit	ASTM C1325

Add new standard to Chapter 35 as follows:

ISO

8336 Fibre-cement flat sheets -- Product specification and test methods

Reason: GYPSUM BOARD" IN SHOWER AND WATER CLOSETS misrepresents the materials permitted for use in this section, specifically fiber-reinforced cement backer board products. The text is revised to reference permitted backer board materials now defined in new TABLE 2509.2, where all 3 permitted products would now be listed. This revision also makes the addition of future recognized products to the Code easier by simple addition to the table.

Performance requirements of ISO 8336, *Fibre-cement flat sheets – Product specification and test methods*, have been harmonized with the performance requirements of ASTM C1288, *Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets*. Fiber-cement producers in Mexico, Central and South America, Europe, Asia, Australia and New Zealand currently manufacture and test their fiber-cement siding products for compliance with ISO 8336. The inclusion of this Standard reference in the IBC will permit manufacturers worldwide to demonstrate product compliance to IBC requirements. The addition of a reference to ISO 8336 in the Code removes a barrier to trade

Cost Impact: The code change proposal will not increase the cost of construction because the proposed code change is editorial in nature to better clarify and present the backer board products currently recognized in the Code.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S307-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2509-S-MULDER.doc

S308–12
2509.3

Proponent: Michael Gardner, Gypsum Association (mgardner@gypsum.org)

Revise as follows:

2509.3 Limitations. Water-resistant gypsum backing board shall not be used in the following locations:

1. Over a vapor retarder in shower or bathtub compartments.
2. Where there will be direct exposure to water or in areas subject to continuous high humidity.
3. ~~On ceilings where frame spacing exceeds 12 inches (305 mm) o.c. for 1/2-inch thick (12.7 mm) water-resistant gypsum backing board and more than 16 inches (406 mm) o.c. for 5/8-inch thick (15.9 mm) water-resistant gypsum backing board.~~

Reason: Concurrent language necessitating the addition of supplemental framing members when water-resistant ceiling board is installed on a ceiling has been or is being removed from the code-referenced gypsum board and panel application standards, GA-216 and ASTM C 840.

Testing has shown that water-resistant gypsum board, as presently manufactured, has better sag resistance than regular core board of the same thickness. As a consequence, the supplemental framing limitation is no longer necessary.

Cost Impact: The code change proposal will reduce the cost of construction.

S308-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2509.3-S-GARDNER

S309–12
202 (NEW), 1404.13 (NEW), 2510.6, Chapter 35 (NEW)

Proponent: John Woestman, Kellen Company, representing Building Enclosure Moisture Management Institute (BEMMI) (jwoestman@kellencompany.com)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

SECTION 202
DEFINITIONS

<u>**POLYMERIC RAINSCREEN PRODUCT.** Material in roll or sheet form, installed behind exterior cladding products, that creates a space that allows drainage and ventilation of liquid and vapor moisture that enters an above-grade exterior wall assembly. Rainscreen products are used to reduce / minimize water transfer to the water resistive barrier.</u>

Add new text as follows:

<u>**1404.13 Polymeric rainscreen products.** Polymeric rainscreen products shall comply with BEMMI 100.</u>

Revise as follows:

2510.6 Water-resistive barriers. *Water-resistive barrier*s shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing (installed in accordance with Section 1405.4) intended to drain to the water-resistive barrier is directed between the layers.

> **Exception:** Where the *water-resistive barrier* that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer<u>,</u> ~~or~~ <u>a</u> drainage space<u>, or polymeric rainscreen products complying with BEMMI 100.</u>

Add new standard to Chapter 35 as follows:

<u>**BEMMI** Building Enclosure Moisture Management Institute</u>
<u>355 Lexington Avenue, 15th Floor</u>
<u>New York, NY 10017-6603</u>

<u>BEMMI 100-12 Voluntary Test Standard for Evaluation of Polymeric Rainscreen Products</u>

Reason: The Building Enclosure Moisture Management Institute (BEMMI) is developing a new voluntary test standard for evaluation of rainscreen products. This standard will include tests to indicate performance of the rainscreen material behind cladding systems and facilitate drainage and drying of moisture that may get into the wall system behind the cladding.

This standard is currently under development, and is targeted for completion by the Final Action Hearings in 2012.

Note: this proposal is not requiring rainscreens to be incorporated in wall systems, only that if rainscreen materials are used, they are to comply with the BEMMI standard.

Cost Impact: This proposal will not increase the cost of construction as it will be an option to current requirements.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S309-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.13 (NEW)-S-WOESTMAN.doc

S310–12

2510.6, Chapter 35 (NEW)

Proponent: Theresa Weston, DuPont Building Innovation (theresa.a.weston@usa.dupont.com)

Revise as follows:

2510.6 Water-resistive barriers. *Water-resistive barrier*s shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of ~~Grade D paper~~ water-resistive barrier complying with ASTM E 2556 Type 1. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing (installed in accordance with Section 1405.4) intended to drain to the water-resistive barrier is directed between the layers.

> **Exception:** Where the *water-resistive barrier* that is applied over wood-based sheathing has a water resistance equal to or greater than that of ~~60-minute Grade D paper~~ a water-resistive barrier complying with ASTM E 2556 Type II and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space.

Add new standard to Chapter 35 as follows:

ASTM

E 2556 - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

Reason: The proposal updates the water-resistive barrier reference to the most recent consensus standard. ASTM E2556 includes house wrap materials, building papers and felt, instead of just building paper and therefore is more representative of the state of the industry. Within ASTM E2556 Grade D paper is a Type I WRB and 60 minute Grade D paper is a Type II WRB. ASTM E2556 is consistent with the current ICC-ES acceptance criteria for water-resistive barriers (AC-38) and therefore should not limit the use of current WRBs.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S310-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2510.6-S-WESTON.doc

S311–12
2510.6

Proponent: John Woestman, Kellen Company, representing Builders Masonry Veneer Manufacturers Association (MVMA) (jwoestman@kellencompany.com)

Revise as follows:

2510.6 Water-resistive barriers. *Water-resistive barrier*s shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a ~~water-resistive vapor-permeable barrier with a performance at least equivalent to~~ water-resistive barrier with a moisture vapor permeance equal to or greater than that of two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing (installed in accordance with Section 1405.4) intended to drain to the water-resistive barrier is directed between the layers.

> **Exception:** Where the *water-resistive barrier* that is applied over wood-based sheathing has a water resistance and a moisture vapor permeance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space.

Reason: Existing language may be considered ambiguous as to what performance attribute is desired to be at least equivalent to two layers of Grade D paper. Water resistance? Moisture vapor permeance? This proposal clarifies moisture vapor permeability is the performance attribute desired to be at least equivalent to Grade D paper. And in the Exception, states moisture vapor permeance equal to or greater than that of 60-minute Grade D paper.

Cost Impact: The code change proposal will not increase the cost of construction.

S311-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2510.6-S-WOESTMAN.doc

S312–12

202 (NEW), 2614 (NEW), Chapter 35 (NEW)

Proponent: Betsy Steiner, EPS Molders Association (emsteiner@epscentral.org)

Add new text as follows:

SECTION 202
DEFINITIONS

GEOFOAM – Block or planar rigid cellular foam polymeric material used in geotechnical engineering applications.

Add new text as follows:

SECTION 2614 GEOFOAM

2614.1 General. The provisions of this Section shall govern the quality and methods of application of geofoam for use as a load bearing material in buildings and structures.

2614.2 Material standards. Geofoam shall comply with ASTM D 6817.

2614.3 Load bearing value. The allowable load bearing capacity of geofoam shall be the compressive resistance at 1% deformation in accordance with ASTM D 6817.

2614.4 Labeling and identification. Geofoam delivered to the job site shall bear the label of an approved agency showing the manufacturer's name, product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

2614.5 Surface-burning characteristics. Geofoam shall have a maximum flame spread index of 75 and a smoke-developed index of 450 when tested at a thickness of 4 inches (102 mm).

2614.6 Protection. Geofoam 4 inches (102 mm) or less in thickness shall be separated from the interior of a building by ½-inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. Geofoam greater than 4 inches (102 mm) in thickness, shall be separated from the interior of the building by two layers of Type X gypsum wallboard or a minimum of 1-inch (25 mm) thickness of masonry or concrete.

Add new standard to Chapter 35 as follows:

ASTM

D 6817-11 - Standard Specification for Rigid Cellular Polystyrene Geofoam

Reason: Geofoam has been used as a geotechnical material since 1960"s providing lightweight, stable solution to engineering challenges. Its many applications include providing stable, insulating sub-surface for building foundations; slope stabilization; road, runway, railway base layer; stadium and theater tiered platform base. Geofoam, in addition to providing excellent insulation also delivers earthquake shock, noise and vibration dampening. Physical properties of geofoam have been established by ASTM Standard D6817. The current version of the standard, D6817-11, is attached to this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S312-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

2614 (NEW)-S-STEINER.doc

S313–12
Chapter 27 (NEW), Chapter 35

Proponent: Paula Baker-Laporte, FAIA, EcoNest Company, representing Natural Building Network (paula@econest.com)

THIS IS A THREE PART CODE CHANGE ALL PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE AS THREE SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

Add new text as follows:

CHAPTER 27
LIGHT STRAW-CLAY CONSTRUCTION

SECTION 2701
GENERAL

2701.1. Scope. This chapter shall govern the use of *light straw-clay* as a *non-bearing* building material and wall *infill* system.

SECTION 2702
DEFINITIONS

2702.1. General. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein. Refer to Chapter 2 of the *International Building Code* for general definitions.

CLAY. Inorganic soil with particle sizes less than 0.00008 in. (0.002 mm) having the characteristics of high to very high dry strength and medium to high plasticity.

CLAY SLIP. A suspension of clay soil in water.

CLAY SOIL. Inorganic soil containing 50% or more clay by volume.

INFILL. Light straw-clay that is placed between the structural members of a building.

LIGHT STRAW-CLAY. A mixture of straw and clay compacted to form insulation and plaster substrate between or around structural and non-structural members in a wall.

NON-BEARING. Not bearing the weight of the building other than the weight of the light straw-clay itself and its finish.

STRAW. The dry stems of cereal grains after the seed heads have been removed.

VOID. Any space in a light straw-clay wall in which a 2-inch (51 mm) sphere can be inserted.

SECTION 2703
NON-BEARING LIGHT STRAW-CLAY CONSTRUCTION

2703.1 General. Light straw-clay shall not be used to support the weight of the building other than the weight of the light straw-clay material and its finish. Light straw-clay shall be limited to use as infill between or around structural and non-structural wall framing members.

2703.2 Structure. The structure of buildings using light straw-clay shall be designed in accordance with the *International Building Code*. Unfinished light straw-clay shall be deemed to have a design dead load of 40 pounds per cubic foot (640 kg per cubic meter) unless otherwise demonstrated to the *building official*.

2703.3 Materials. The materials used in light straw-clay construction shall be in accordance with Sections 2703.3.1, 2703.3.2 and 2703.3.3.

2703.3.1 Straw. Straw shall be wheat, rye, oats, rice, or barley, and shall be free of visible decay and insects.

2703.3.2 Clay Soil. Suitability of clay soil shall be determined in accordance with the Figure 2 Ribbon Test or the Figure 3 Ball Test of the Appendix to ASTM E 2392/2392M.

2703.3.3 Clay slip. Clay slip shall be of sufficient viscosity such that a finger dipped in the slip and withdrawn remains coated with an opaque coating.

2703.3.4 Light straw-clay mixture. Light straw-clay shall contain not less than 65 percent and not more than 85 percent straw, by volume of bale-compacted straw to clay soil. Loose straw shall be mixed and coated with clay slip such that there is no more than 5 percent uncoated straw.

2703.4 Wall Construction. Light straw-clay wall construction shall be in accordance with the requirements of Sections 2703.4.1, through 2703.4.8.

2703.4.1 Number of stories. The light straw-clay infill system requirements of this chapter shall be limited to buildings and structures that are not more than 2 stories in height above grade plane. Light straw-clay infill systems for buildings that are greater than 2 stories in height above grade plane shall be in accordance with an approved design by a registered design professional.

2703.4.2 Light straw-clay maximum thickness. Light straw-clay shall be not more than12 inches (305 mm) thick, to allow adequate drying of the installed material.

2703.4.3 Distance above grade. Light straw-clay shall not be used below grade. Light straw-clay and its exterior finish shall be not less than 8 inches (203 mm) above exterior finished grade.

2703.4.4 Moisture barrier. An approved moisture barrier shall separate the bottom of light straw-clay walls from any masonry or concrete foundation or slab that directly supports the walls. Penetrations and joints in the barrier shall be sealed with an approved sealant.

2703.4.5 Contact with wood members. Light straw clay shall be permitted to be in contact with untreated wood members.

2703.4.6 Contact with non-wood structural members.
Non-wood structural members in contact with light straw-clay shall be resistant to corrosion or shall be coated to prevent corrosion with an approved coating.

2703.4.7 Wall Reinforcing. Light straw-clay shall be reinforced as follows:

1. Vertical reinforcing shall be a minimum of nominal 2-inch by 4-inch (51 mm by 102 mm) wood members at a maximum of 32 inches (813 mm) on center where the vertical reinforcing is non-bearing and at 24”(610mm) on center where it is load-bearing. The vertical reinforcing shall be attached at top and bottom in accordance with Table 2304.9.1 and anchored to the foundation in accordance with Section 2308.6 or shall be in accordance with an approved design by a registered design professional. Vertical reinforcing shall not exceed an unrestrained height of 10 feet (3,048 mm) or shall be in accordance with an approved design by a registered design professional.
2. Horizontal reinforcing to control settlement of the light straw-clay infill, and to resist out of plane forces shall be installed in the center of the wall at not more than 24 inches (610 mm) on center

and shall be secured to vertical members. Horizontal reinforcing shall be of any of the following: ¾ inch (19 mm) bamboo, ½ inch (13 mm) fiberglass rod, 1-inch (25 mm) wood dowel or nominal 1-inch by 2-inch (25 mm by 51 mm) wood.

2703.4.8 Installation. Light straw-clay shall be installed in accordance with the following:

1. Formwork shall be sufficiently strong to resist bowing when the light straw-clay is compacted into the forms.
2. Light straw-clay shall be uniformly placed into forms and evenly tamped to achieve stable walls free of voids. Light straw-clay shall be placed in lifts of no more than 6 inches (152 mm) and shall be thoroughly tamped before additional material is added.
3 Formwork shall be removed from walls within 24 hours after tamping, and walls shall remain exposed until moisture content is in accordance with Section 2703.5.2. Any visible voids shall be patched with light straw-clay prior to plastering.

2703.4.9 Openings in Walls. Openings in walls shall be in accordance with the following:

1. Doors and windows. Rough bucks or frames for doors and windows shall be fastened securely to structural members. Windows and doors shall be flashed in accordance with the *International Building Code*.
2. Window sills. An approved moisture barrier shall be installed at window sills in light straw-clay walls prior to installation of windows.

2703.5 Wall Finishes. The interior and exterior surfaces of light straw-clay walls shall be protected with a finish in accordance with Sections 2703.5.1 through 2703.5.4.

2703.5.1 Moisture content of light straw-clay prior to application of finish. Light straw-clay walls shall be dry to a maximum moisture content of 20 percent at a depth of 4 inches (102 mm), as measured from each side of the wall, prior to the application of finish on either side of the wall. Moisture content shall be measured with a moisture meter equipped with a probe that is designed for use with baled straw or hay.

2703.5.2 Plaster finish. Exterior plaster finishes shall be clay plaster and lime plaster. Interior plaster finishes shall be clay plaster, lime plaster, and gypsum plaster. Plasters shall be permitted to be applied directly to the surface of the light straw-clay walls without reinforcement, except that the juncture of dissimilar substrates shall be in accordance with Section 2703.5.3. Exterior clay plaster shall be finished with a lime-based or silicate-mineral coating.

2703.5.3 Bridging across dissimilar substrates. Bridging shall be installed across dissimilar substrates prior to the application of plaster. Acceptable bridging materials shall include: expanded metal lath, woven wire mesh, welded wire mesh, fiberglass mesh, reed matting, or burlap. Bridging shall extend not less than 4 inches (102 mm), on both sides of the juncture.

2703.5.4 Exterior siding. Exterior wood, metal, or composite material siding shall be spaced a minimum of 3/4 inch (19 mm) from the light straw-clay such that a ventilation space is created to allow for moisture diffusion. The siding shall be fastened to wood furring strips in accordance with manufacturer's recommendations. Furring strips shall be spaced not more than 32 inches (813 mm) on center, and shall be securely fastened to the vertical wall reinforcing or structural framing. Insect screening shall be provided at the top and bottom of the ventilation space. An air barrier consisting of clay plaster, lime plaster, or other approved air barrier shall be applied to the light straw-clay prior to application of siding.

PART II – IBC GENERAL

Add new text as follows:

SECTION 2704
TYPE OF CONSTRUCTION

2704.1 Type of construction. Buildings or portions thereof containing light straw-clay in accordance with this chapter shall be classified as Type V-B construction.

PART III - IECC

Add new text as follows:

SECTION 2705
THERMAL INSULATION

2705.1 R-value. Light straw-clay, when installed in accordance with this chapter, shall be deemed to have an R-value of 1.6 per inch.

Add new standard to Chapter 35 as follows:

ASTM

E 2392/2392 M-10 Standard Guide for Design of Earthen Wall Building Systems

Reason: The purpose of the proposed code change is to include the use of Light Straw Clay as a nonload-bearing building material and wall infill ystem into the IBC because no such section currently exists.

Light straw-clay construction has proven to be a viable, ecologically sound, and energy efficient building method. To date, permitting of light straw-clay construction has generally been left to the discretion of individual building officials on a case-by-case basis. Two exceptions are the State of New Mexico and the State of Oregon. Since 1998 the State of New Mexico has successfully permitted straw-clay construction using its standard permitting process when a project complies with its "Clay Straw Guidelines".

The proposed light straw-clay section of the IBC is derived from and builds upon the fourteen years of success of New Mexico's Clay Straw Guidelines. In October of 2011 the Oregon Reach Code (ORC) was amended to include light straw-clay construction. Inclusion in the IBC would make proven provisions accessible to more designers and builders interested in using this environmentally beneficial material and to building officials who will be evaluating and enforcing its proper use.

The proposed mixture of clay and straw as a monolithic non-load bearing building enclosure has been successfully used in the United States since 1990 and since 1950 in Europe. Prior to this a heavier form of clay, straw, and woven wood construction known as wattle and daub was in common use throughout Europe, Africa, Asia, and North and South America. Many thousands of existing structures dating back 300-400 years have been continuously occupied, attesting to the durability of these natural materials. In the United States residential and non-residential structures using straw-clay have been completed in 17 states, and most of those have been constructed with full permits and inspections.

The centuries old European predecessors and light straw clay buildings built to date in North America have all been constructed without the use of a moisture barrier. The proposed light straw clay materials are vapor permeable and do not require a moisture barrier. Code precedents for vapor permeable construction exist for adobe construction, log construction and half-timber construction. In these systems as in light straw clay construction there is sufficient hygric capacity to hold and re-release moisture without damage to structural members or degradation of the wall due to weather related moisture fluctuations. Furthermore for exterior siding applications, with ventilated space and rain screen a water resistive barrier is not necessary.

Through The EcoNest Company, and as a licensed architect for over 25 years, I have been involved in the design and/or construction of over 50 buildings utilizing light straw-clay construction. In 2005 I co-authored, with my husband and business partner Robert Laporte, the book "Econest, Creating Sustainable Sanctuaries of Clay, Straw and Timber".

Official guidelines for straw-clay construction have been in effect in New Mexico since 1998. At least 20 residential structures have been successfully permitted and built since that time in New Mexico following these guidelines. Other building officials in surrounding States have also permitted straw-clay construction in their jurisdictions based on these guidelines.

In 2004 the Canada Mortgage and Housing Corporation (CMHC) funded a study to explore the material characteristics of Straw Light Clay (SLC) construction. The proposed section for the IBC uses this study as well as the many years of experience of our company and other practitioners of light straw-clay construction as its basis. The CMHC study includes issues of thermal performance, fire-resistance, moisture, and vapor permeability. The CMHC study and other supporting documentation is available for viewing and download at: http://www.econesthomes.com/natural-building-resources/technical/. EcoNest's numerous projects utilizing light straw-clay construction can be viewed at www.econesthomes.com.

- 2011 Oregon Reach Code (Section 1307) (Based on 2012 International Green Construction Code)
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- J. Thornton (2004) *Initial Material Characterization of Straw Light Clay* Canada Mortgage and Housing Corporation
  State of New Mexico Construction Industries Division (2001) *Clay Straw Guidelines*

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [IBC] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

S313-12

PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE - GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – INTERNATIONAL ENERGY CONSERVATION CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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S314–12
Appendix N (NEW)

Proponent: Paula Baker-Laporte, FAIA, EcoNest Company, representing Natural Building Network (paula@econest.com)

Add new text as follows:

APPENDIX N
LIGHT STRAW-CLAY CONSTRUCTION

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION N101
GENERAL

N101.1. Scope. This appendix shall govern the use of *light straw-clay* as a *non-bearing* building material and wall infill system.

SECTION N102
DEFINITIONS

N102.1. General. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 for the *International Building Code* for general definitions.

CLAY. Inorganic soil with particle sizes less than 0.00008 in. (0.002 mm) having the characteristics of high to very high dry strength and medium to high plasticity.

CLAY SLIP. A suspension of clay soil in water.

CLAY SOIL. Inorganic soil containing 50% or more clay by volume.

INFILL. Light straw-clay that is placed between the structural members of a building.

LIGHT STRAW-CLAY. A mixture of straw and clay compacted to form insulation and plaster substrate between or around structural and non-structural members in a wall.

NON-BEARING. Not bearing the weight of the building other than the weight of the light straw-clay itself and its finish.

STRAW. The dry stems of cereal grains after the seed heads have been removed.

VOID. Any space in a light straw-clay wall in which a 2-inch (51 mm) sphere can be inserted.

SECTION N103
NON-BEARING LIGHT STRAW-CLAY CONSTRUCTION

N103.1 General. Light straw-clay shall not be used to support the weight of the building other than the weight of the light straw-clay material and its finish. Light straw-clay shall be limited to use as infill between or around structural and non-structural wall framing members.

N103.2 Structure. The structure of buildings using light straw-clay shall be designed in accordance with the *International Building Code*. Unfinished light straw-clay shall be deemed to have a design dead load of 40 pounds per cubic foot (640 kg per cubic meter) unless otherwise demonstrated to the *building* *official*.

N103.3 Materials. The materials used in light straw-clay construction shall be in accordance with Sections N103.3.1, N103.3.2, N103.3.3 and N103.3.4.

N103.3.1 Straw. Straw shall be wheat, rye, oats, rice, or barley, and shall be free of visible decay and insects.

N103.3.2 Clay soil. Suitability of clay soil shall be determined in accordance with the Figure 2 Ribbon Test or the Figure 3 Ball Test of the Appendix to ASTM 2392/2392M.

N103.3.3 Clay slip. Clay slip shall be of sufficient viscosity such that a finger dipped in the slip and withdrawn remains coated with an opaque coating.

N103.3.4 Light straw-clay mixture. Light straw-clay shall contain a minimum of 65 percent and a maximum of 85 percent straw, by volume of bale-compacted straw to clay soil. Loose straw shall be mixed and coated with clay slip such that there is no more than 5 percent uncoated straw.

N103.4 Wall Construction. Light straw-clay wall construction shall be in accordance with the requirements of Sections N103.4.1, through N103.4.8.

N103.4.1 Number of stories. The light straw-clay infill system requirements of this chapter shall be limited to buildings and structures that are not more than 2 stories in height above grade plane. Light straw-clay infill systems for buildings that are greater than 2 stories in height above grade plane shall be in accordance with an approved design by a registered design professional.

N103.4.2 Light straw-clay maximum thickness. Light straw-clay shall be not more than12 inches (305 mm) thick, to allow adequate drying of the installed material.

N103.4.3 Distance above grade. Light straw-clay shall not be used below grade. Light straw-clay and its exterior finish shall be not less than 8 inches (203 mm) above exterior finished grade.

N103.4.4 Moisture barrier. An approved moisture barrier shall separate the bottom of light straw-clay walls from any masonry or concrete foundation or slab that directly supports the walls. Penetrations and joints in the barrier, shall be sealed with an approved sealant.

N103.4.5 Contact with wood members. Light straw clay shall be permitted to be in contact with untreated wood members.

N103.4.6 Contact with non-wood structural members. Non-wood structural members in contact with light straw-clay shall be resistant to corrosion or shall be coated to prevent corrosion with an approved coating.

N103.4.7 Wall Reinforcing. Light straw-clay shall be reinforced as follows:

1, Vertical reinforcing shall be a minimum of nominal 2-inch by 4-inch (51 mm by 102 mm) wood members at a maximum of 32 inches (813 mm) on center where the vertical reinforcing is non-bearing and at 24”(610mm) on center where it is load-bearing. The vertical reinforcing shall be attached at top and bottom in accordance with Table 2304.9.1 and anchored to the foundation in accordance with Section 2308.6 or shall be in accordance with an approved design by a registered design professional. Vertical reinforcing shall not exceed an unrestrained height of 10 feet (3,048 mm) or shall be in accordance with an approved design by a registered design professional.

2. Horizontal reinforcing to control settlement of the light straw-clay infill, and to resist out of plane forces shall be installed in the center of the wall at not more than 24 inches (610 mm) on center

and shall be secured to vertical members. Horizontal reinforcing shall be of any of the following: ¾ inch (19 mm) bamboo, ½ inch (13 mm) fiberglass rod, 1-inch (25 mm) wood dowel or nominal 1-inch by 2-inch (25 mm by 51 mm) wood.

N103.4.8 Installation. Light straw-clay shall be installed in accordance with the following:

1. Formwork shall be sufficiently strong to resist bowing when the light straw-clay is compacted into the forms.
2. Light straw-clay shall be uniformly placed into forms and evenly tamped to achieve stable walls free of voids. Light straw-clay shall be placed in lifts of no more than 6 inches (152 mm) and shall be thoroughly tamped before additional material is added.
3. Formwork shall be removed from walls within 24 hours after tamping, and walls shall remain exposed until moisture content is in accordance with Section N103.5. Any visible voids shall be patched with light straw-clay prior to plastering.

N103.4.9 Openings in Walls. Openings in walls shall be in accordance with the following:

1. Doors and windows. Rough bucks or frames for doors and windows shall be fastened securely to structural members. Windows and doors shall be flashed in accordance with the *International Building Code*.
2. Window sills. An approved moisture barrier shall be installed at window sills in light straw-clay walls prior to installation of windows.

N103.5 Wall Finishes. The interior and exterior surfaces of light straw-clay walls shall be protected with a finish in accordance with Sections N103.5.1 through N103.5.4.

N103.5.1 Moisture content of light straw-clay prior to application of finish. Light straw-clay walls shall be dry to a maximum moisture content of 20 percent at a depth of 4 inches (102 mm), as measured from each side of the wall, prior to the application of finish on either side of the wall. Moisture content shall be measured with a moisture meter equipped with a probe that is designed for use with baled straw or hay.

N103.5.2 Plaster finish. Exterior plaster finishes shall be clay plaster and lime plaster. Interior plaster finishes shall be clay plaster, lime plaster, and gypsum plaster. Plasters shall be permitted to be applied directly to the surface of the light straw-clay walls without reinforcement, except that the juncture of dissimilar substrates shall be in accordance with Section N103.5.3. Exterior clay plaster shall be finished with a lime-based or silicate-mineral coating.

N103.5.3 Bridging across dissimilar substrates. Bridging shall be installed across dissimilar substrates prior to the application of plaster. Acceptable bridging materials shall include: expanded metal lath, woven wire mesh, welded wire mesh, fiberglass mesh, reed matting, or burlap. Bridging shall extend not less than 4 inches (102 mm), on both sides of the juncture.

N103.5.4 Exterior siding. Exterior wood, metal, or composite material siding shall be spaced a minimum of 3/4 inch (19 mm) from the light straw-clay such that a ventilation space is created to allow for moisture diffusion. The siding shall be fastened to wood furring strips in accordance with manufacturer's recommendations. Furring strips shall be spaced not more than 32 inches (813 mm) on center, and shall be securely fastened to the vertical wall reinforcing or structural framing. Insect screening shall be provided at the top and bottom of the ventilation space. An air barrier consisting of clay plaster, lime plaster, or other approved air barrier shall be applied to the light straw-clay prior to application of siding.

SECTION N104
TYPE OF CONSTRUCTION

N104.1 Type of construction. Buildings or portions thereof containing light straw-clay in accordance with this appendix shall be classified as Type V-B construction.

SECTION N105
THERMAL INSULATION

N105.1 R-value. Light straw-clay, when installed in accordance with this chapter, shall be deemed to have an R-value of 1.6 per inch.

SECTION N106
REFERENCE STANDARDS

ASTM

E2392-10 Standard Guide for Design Earthen Wall Building Systems

Reason: The purpose of the proposed code change is to include Light Straw Clay as a nonload-bearing building material and wall infill system into the IBC because no such section currently exists.

Light straw-clay construction has proven to be a viable, ecologically sound, and energy efficient building method. To date, permitting of light straw-clay construction has generally been left to the discretion of individual building officials on a case-by-case basis. Two exceptions are the State of New Mexico and the State of Oregon. Since 1998 the State of New Mexico has successfully permitted straw-clay construction using its standard permitting process when a project complies with its "Clay Straw Guidelines".

The proposed light straw-clay section of the IBC is derived from and builds upon the fourteen years of success of New Mexico's Clay Straw Guidelines. In October of 2011 the Oregon Reach Code (ORC) was amended to include light straw-clay construction. Inclusion in the IBC would make proven provisions accessible to more designers and builders interested in using this environmentally beneficial material and to building officials who will be evaluating and enforcing its proper use.

The proposed mixture of clay and straw as a monolithic non-load bearing building enclosure has been successfully used in the United States since 1990 and since 1950 in Europe. Prior to this a heavier form of clay, straw, and woven wood construction known as wattle and daub was in common use throughout Europe, Africa, Asia, and North and South America. Many thousands of existing structures dating back 300-400 years have been continuously occupied, attesting to the durability of these natural materials. In the United States residential and non-residential structures using straw-clay have been completed in 17 states, and most of those have been constructed with full permits and inspections.

The centuries old European predecessors and light straw clay buildings built to date in North America have all been constructed without the use of a moisture barrier. The proposed light straw clay materials are vapor permeable and do not require a moisture barrier. Code precedents for vapor permeable construction exist for adobe construction, log construction and half-timber construction. In these systems as in light straw clay construction there is sufficient hygric capacity to hold and re-release moisture without damage to structural members or degradation of the wall due to weather related moisture fluctuations. Furthermore for exterior siding applications, with ventilated space and rain screen a water resistive barrier is not necessary.

Through The EcoNest Company, and as a licensed architect for over 25 years, I have been involved in the design and/or construction of over 50 buildings utilizing light straw-clay construction. In 2005 I co-authored, with my husband and business partner Robert Laporte, the book "Econest, Creating Sustainable Sanctuaries of Clay, Straw and Timber".

Official guidelines for straw-clay construction have been in effect in New Mexico since 1998. At least 20 residential structures have been successfully permitted and built since that time in New Mexico following these guidelines. Other building officials in surrounding States have also permitted straw-clay construction in their jurisdictions based on these guidelines.

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Cost Impact: The code change proposal will not increase the cost of construction.

S314-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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S315–12
Appendix N (NEW)

Proponent: Martin Hammer, Architect, representing California Straw Building Association, Colorado Straw Bale Association, Straw Bale Construction Association – New Mexico, Ontario Bale Building Coalition, Development Center for Appropriate Technology, Environmental Building Network (mfhammer@pacbell.net)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC STRUCTURAL

Add new text as follows:

APPENDIX N
STRAWBALE CONSTRUCTION

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION N101
GENERAL

N101.1 Scope. This appendix shall govern the use of baled straw as a building material.

SECTION N102
DEFINITIONS

N102.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of the *International Building Code* for general definitions.

BALE. Equivalent to straw bale.

CLAY. Inorganic soil with particle sizes less than 0.00008 in. (0.002 mm) having the characteristics of high to very high dry strength and medium to high plasticity.

CLAY SLIP. A suspension of clay particles in water.

FLAKE. An intact section of compressed straw removed from an untied bale.

LAID FLAT. The orientation of a bale with its largest faces horizontal, its longest dimension parallel with the wall plane, its ties concealed in the unfinished wall and its straw lengths oriented across the thickness of the wall.

LOAD-BEARING WALL. For the purposes of this appendix, any strawbale wall that supports more than 100 lb/linear ft (1,459 N/m) of vertical load in addition to its own weight.

MESH. An openwork fabric of linked strands of metal, plastic, or natural or synthetic fiber, embedded in plaster to provide tensile reinforcement or bonding.

NONLOAD-BEARING WALL. For the purpose of this appendix, any wall that is not a load-bearing wall.

NONSTRUCTURAL WALL. All walls other than load-bearing walls or shear walls.

ON-EDGE. The orientation of a bale with its largest faces vertical, its longest dimension parallel with the wall plane, its ties on the face of the wall, and its straw lengths oriented vertically.

PIN. Metal rod, wood dowel, or bamboo, driven into, or through-tied on the surface of stacked bales for the purpose of connection or stability.

PLASTER. Gypsum, lime, cement-lime, or cement plasters, as defined in Chapter 25 and in Section N106, or clay plaster as defined in Section N106.9, or soil-cement plaster as defined in Section N106.10.

PRE-COMPRESSION. Vertical compression of stacked bales before the application of finish.

REINFORCED PLASTER. A plaster containing mesh reinforcement.

RUNNING BOND. For the purposes of this appendix, the placement of straw bales such that the head joints in successive courses are offset at least one quarter the bale length.

SHEAR WALL. A strawbale wall designed to resist lateral forces parallel to the plane of the wall in accordance with Section N105.15.

SKIN. The compilation of plaster and reinforcing, if any, applied to the surface of stacked bales.

STRUCTURAL WALL. A wall that meets the definition for a load-bearing wall or shear wall.

STACK BOND. For the purposes of this appendix, the placement of straw bales such that head joints in successive courses are vertically aligned.

STRAW. The dry stems of cereal grains after the seed heads have been removed.

STRAW BALE. A rectangular compressed block of straw, bound by ties.

STRAWBALE. The adjective form of straw bale.

STRAW-CLAY. Loose straw mixed and coated with clay slip.

TIE. A synthetic fiber, natural fiber, or metal wire used to confine a straw bale.

TRUTH WINDOW. An area of a strawbale wall left without its finish, to allow view of the straw otherwise concealed by its finish.

SECTION N103
BALES

N103.1 Types of straw. Bales shall be composed of straw from wheat, rice, rye, barley, or oat.

N103.2 Shape. Bales shall be rectangular in shape.

N103.3 Size. Bales shall have a minimum height and thickness of 12 inches (305 mm), except as otherwise permitted or required in this appendix. Bales used within a continuous wall shall be of consistent height and thickness to ensure even distribution of loads within the wall system.

N103.4 Ties. Bales shall be confined with synthetic fiber, natural fiber, or metal ties sufficient to maintain required bale density. Ties shall be at least 3 inches (76 mm) and not more than 6 inches (152 mm) from bale faces and shall be spaced not more than 12 (305 mm) inches apart. Bales with broken ties shall be retied with sufficient tension to maintain required bale density.

N103.5 Moisture content. The moisture content of bales at the time of application of the first coat of plaster or the installation of another finish shall not exceed 20 percent of the weight of the bale. The moisture content of bales shall be determined by use of a moisture meter designed for use with baled straw or hay, equipped with a probe of sufficient length to reach the center of the bale. At least 5 percent and not less than ten bales used shall be randomly selected and tested.

N103.6 Density. Bales shall have a minimum dry density of 6.5 pounds per cubic foot (92 kg/cubic meter). The dry density shall be calculated by subtracting the weight of the moisture in pounds (kg) from the actual bale weight and dividing by the volume of the bale in cubic feet (cubic meters). At least 2 percent and not less than five bales to be used shall be randomly selected and tested on site.

N103.7 Partial bales. Partial bales made after original fabrication shall be retied with ties complying with N103.4.

SECTION N104
MOISTURE CONTROL

N104.1 General. All weather-exposed bale walls and bale walls enclosing showers or steam rooms, shall be protected from water damage and moisture intrusion in accordance with this section.

N104.2 Water-resistive barriers and vapor permeance ratings. Plastered bale walls shall be constructed without any membrane barrier between straw and plaster to facilitate transpiration of moisture from the bales, and to secure a structural bond between straw and plaster, except as permitted or required elsewhere in this appendix. Where a water-resistive barrier is placed behind the exterior finish, it shall have a vapor permeance rating of at least 5 perms, except as permitted or required elsewhere in this appendix. Wall finishes shall be vapor permeable or shall have an equivalent vapor permeance rating of a Class III vapor retarder.

N104.3 Horizontal surfaces. Bale walls and other bale elements shall be provided with a moisture barrier at all weather-exposed horizontal surfaces. The moisture barrier shall be of a material and installation that will prevent water from entering the wall system. Horizontal surfaces shall include, but shall not be limited to, exterior window sills, sills at exterior niches, and buttresses. The finish material at such surfaces shall be sloped not less than 1 unit vertical in 12 units horizontal (8-percent slope) and shall drain away from all bale walls and elements. Where the moisture barrier is below the finish material, it shall be sloped not less than 1 unit vertical in 12 units horizontal (8-percent slope) and shall drain to the outside surface of the bale's vertical finish.

N104.4 Bale and concrete separation. A sheet or liquid applied Class II vapor retarder shall be installed between bales and supporting concrete or masonry. The bales shall be separated from the vapor retarder by not less than 3/4-inch (19 mm), and that space shall be filled with an insulating material such as wood or rigid insulation, or a material that allows vapor dispersion such as gravel, or other *approved* insulating or vapor dispersion material. Sill plates in structural walls shall comply with Table N105.14 and Table N105.15. Where bales abut a concrete or masonry wall that retains earth, a Class II vapor retarder shall be provided between such wall and the bales.

N104.5 Separation of bales and earth. Bales shall be separated from earth a minimum of 8" (203 mm).

N104.6 Separation of exterior plaster and earth. Exterior plaster applied to straw bales shall be located not less than 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas.

N104.7 Showers walls and steam rooms. Bale walls enclosing showers or steam rooms shall be protected by a water-resistive barrier or by a Class I or Class II vapor retarder on the interior face between the finish and the bales.

SECTION N105
STRUCTURAL USE

N105.1 Scope. This section shall apply to structural strawbale walls. Sections N105.11, N105.12, and N105.16 shall also apply to nonstructural strawbale walls.

N105.2 General. An approved engineered design in accordance with Section N105 and the *International Building Code* shall be provided for buildings or portions thereof using structural strawbale walls.

N105.3 Foundations. Foundations for strawbale walls shall be of any type permitted by, and shall be designed in accordance with, the *International Building Code*.

N105.4 Building height and stories. Building height shall not exceed 35 feet and the limits contained in Table N105.13. Structural use of strawbale walls shall be permitted in multi-story buildings where:

1. Complete vertical and lateral load paths are demonstrated by an *approved* engineered design.
2. Strawbale walls interrupted by floor assemblies are designed and detailed by a *registered design professional*.

N105.5 Configuration of bales. Bales in structural walls shall be laid flat or on-edge and in a running bond or stack bond, except that bales in structural walls with unreinforced plasters shall be laid in a running bond only.

N105.6 Pre-compression of load-bearing strawbale walls. Prior to application of plaster, walls designed to be load-bearing shall be pre-compressed by a uniform load of not less than 100 pounds per linear foot.

N105.7 Voids and stuffing. Voids between bales in structural strawbale walls shall not exceed 4 inches (102 mm) in width, and such voids shall be stuffed with flakes of straw or straw-clay, before application of finish.

N105.8 Plaster skins. Plaster skins on structural walls shall be of any type permitted by Section N106, except gypsum plaster, and shall be in accordance with Tables N105.14 and N105.15.

N105.8.1 Straightness. Plaster skins on structural strawbale walls shall be straight, as a function of the bale wall surfaces they are applied to, as follows:

1. As measured across the face of a bale, straw bulges shall not protrude more than 3/4 inch (19 mm) across 2 feet (610 mm) of its height or length.

2. As measured across the face of a bale wall, straw bulges shall not protrude from the vertical plane of a bale wall more than 2 inches (51 mm) over 8 feet (2438 mm).

3. The vertical face of adjacent bales shall not be offset more than 1/2 inch (13 mm)

N105.8.2 Plaster and membranes. Structural strawbale walls shall not have a membrane between straw and plaster, or shall have attachment through the bale wall from one plaster skin to the other in accordance with an *approved* engineered design.

N105.9 Transfer of loads to and from plaster skins. Where plastered strawbale walls are used to support superimposed vertical loads, such loads shall be transferred to the plaster skins by continuous direct bearing or by an *approved* engineered design. Where plastered strawbale walls are used to resist in-plane lateral loads, such loads shall be transferred via the reinforcing mesh from the structural member or assembly above and to the sill plate in accordance with Table N105.15, or by an *approved* engineered design.

N105.10 Support of plaster skins. Plaster skins for structural strawbale walls shall be continuously supported along their bottom edge to facilitate the transfer of loads to the foundation system. Acceptable supports include, but are not limited to: a concrete or masonry stem wall, a concrete slab on grade, a wood-framed floor adequately blocked, with an *approved* engineered design, or a steel angle adequately anchored, with an *approved* engineered design. A conventional metal or plastic weep screed is not an acceptable support.

N105.11 Unrestrained wall height. Strawbale walls shall not exceed the ratios of stacked bale height to bale thickness between restraints, as stated in Section 2505.12, except where an *approved* engineered design demonstrates the wall will resist buckling from superimposed vertical loads and out-of-plane design loads.

N105.12 Resistance to out-of-plane lateral loads. Structural and non-structural strawbale walls shall be considered capable of resisting out-of-plane loads prescribed in the *International Building Code* with the following limitations and requirements, except where an *approved* engineered design is provided:

1. Walls with unreinforced plasters or a non-plaster finish, and without pins in accordance with N105.12.4, or other *approved* means of out-of-plane bracing, shall not exceed a 5:1 ratio of stacked bale height to bale thickness.
2. Clay plaster walls with reinforced plasters, or pins in accordance with N105.12 Item 4, or other *approved* means of out-of-plane bracing, shall not exceed the ratio indicated in Equation 24-1. Plaster reinforcement shall be any type described in Table N105.15 with staples spaced not more than 6 inches (152 mm) on center.

$H^2/T = 65$ **(Equation N-1)**

Where:

H = stacked bale height
T = bale thickness
H and T are measured in feet. ($H^2/T = 19{,}800$ when H and T are measured in mm)

3. Cement, cement-lime, lime, or soil cement plaster walls with reinforced plasters, or pins in accordance with N105.12 Item 4, or other *approved* means of out-of-plane bracing, shall not exceed the ratio indicated in Equation 24-2. Plaster reinforcement shall be any type described in Table N105.15 with staples spaced not more than 6 inches (152 mm) on center.

$H^2/T = 80$ **(Equation N-2)**

Where:

H = stacked bale height
T = bale thickness
H and T are measured in feet. ($H^2/T = 24{,}400$ when H and T are measured in mm)

4. Pins shall be in accordance with an *approved* engineered design or shall comply with the following:
    - 4.1 Pins shall be 3/8 inch (10 mm) diameter steel, 3/4 inch diameter (19 mm) wood, or 1/2 inch diameter (13 mm) bamboo. Pins shall be external or internal.
    - 4.2 External pins shall be installed on both sides of the wall spaced not more than 24 inches (610 mm) on center.
    - 4.3 External pins shall have full lateral bearing on the sill plate and the roof- or floor-bearing member, and shall be tightly tied through the wall to an opposing pin with ties spaced not more than 30 inches (762 mm) apart and not more than 15 inches (381 mm) from each end.
    - 4.4 Internal pins shall be installed vertically not more than 24 inches (610 mm) on center in the center third of the bales, and shall extend from top course to bottom course.

4.5 The bottom course shall be similarly connected to its support and the top course shall be similarly connected to the roof- or floor-bearing member above with pins or other *approved* means.
4.6 Internal pins shall be continuous or shall overlap through not less than one bale course.

N105.13 Design coefficients and factors for seismic design. The values given in Table N105.13 shall apply to seismic design using strawbale shear walls detailed in accordance with Table N105.15.

N105.14 Load-bearing strawbale walls. Load-bearing strawbale walls shall be in accordance with Table N105.14 as part of an *approved* engineered design to support superimposed vertical loads.

N105.15 Strawbale shear walls. Strawbale shear walls shall be in accordance with Table N105.13 as part of an *approved* engineered design to resist in-plane lateral loads. Other *approved* in-plane lateral load resisting systems shall be permitted to be used in combination with strawbale shear walls with apportionment of design loads as prescribed in the *International Building Code*.

N105.16 Connection of light-frame walls to strawbale walls. Light-frame walls perpendicular to, or at an angle to a straw bale wall assembly, shall be fastened to the bottom and top wood members of the strawbale wall in accordance with requirements for wood or cold-formed steel light-frame walls in the *International Building Code*, or the abutting stud shall be connected to alternating straw bale courses with a 1/2 inch (13mm) diameter steel, 3/4" diameter (19 mm) wood, or 5/8" diameter (16 mm) bamboo dowel, with minimum 8 inch (203 mm) penetration.

TABLE N105.13
DESIGN COEFFICIENTS AND FACTORS FOR SEISMIC-FORCE-RESISTING SYSTEMS

Seismic-Force-Resisting System		**Response Modification Coefficient, *R*[1]**	**System Overstrength Factor, Omega[2]**	**Deflection Amplification Factor, *C***	**Structural System Limitations and Building Height (ft) Limits**				
					Seismic Design Category				
					B	C	D	E	F
A. Bearing Wall Systems									
Strawbale shear walls		3.5	3	3	25	25	15	15	15
B. Building Frame Systems									
Strawbale shear walls		4	3	3.5	35	35	25	25	25

a. R reduces forces to a strength level, not an allowable stress level
b. The tabulated value of the overstrength factor is permitted to be reduced by subtracting 0.5 for structures with flexible diaphragms, but shall not be taken as less than 2.0 for any structure.

TABLE N105.14
ALLOWABLE GRAVITY LOADS (LBS./FOOT) FOR PLASTERED STRAWBALE WALLS

WALL DESIGNATION	**PLASTER (both sides) Thickness each side**	**SILL PLATES[b,c]**	**ANCHOR[c] BOLTS (or other sill fastening)**	**MESH[d]**	**STAPLES[e,f,g]**	**ALLOWABLE BEARING CAPACITY[h] (plf)**
A	Clay[i] 1-1/2"	c	c	None required[j]	None required[j]	400
B	Soil-cement[k] 1"	c	c	d	e,f,g	800
C	Lime[l] 7/8"	c	c	d	e,f,g	500

WALL DESIGNATION	PLASTER (both sides) Thickness each side	SILL PLATES[b,c]	ANCHOR[c] BOLTS (or other sill fastening)	MESH[d]	STAPLES[e,f,g]	ALLOWABLE BEARING CAPACITY[h] (plf)
D	Cement-lime[k] 7/8”	c	c	d	e,f,g	800
E	Cement 7/8”	c	c	d	e,f,g	800

For SI: 1 inch=25.4mm, 1 pound per foot = 14.5939 N/m.

a. Plasters shall conform with Sections N106.9 through N106.12 for makeup and thickness, with Section N105.8.1 for straightness, and with Section N105.10 for support of plaster skins.

b. Sill plates shall support and be flush with each face of the bale wall and shall be preservative-treated where required by the *International Building Code*..

c. For walls supporting gravity loads only or for non-structural walls, sill plates and fastening shall be in accordance with the requirements for wood framed walls in the *International Building Code*. See Table N105.15 for requirements for shear walls.

d. Any metal mesh allowed by this section shall be installed throughout the plaster with minimum 4-inch laps and fastened in accordance with footnote e.

e. Staples shall be at maximum spacing of 2-inches on center, to roof or floor bearing assembly, or as shown in an approved design in accordance with Section N105.9, and at a maximum spacing of 4-inches on center to sill plates.

f. Staples shall be gun staples, stainless steel or electro-galvanized, 16 gauge with 1 ¼-inch legs, 7/16-inch crown; or manually driven staples, galvanized 15 gauge with 7/8-inch legs, 3/16-inch inner spread and rounded shoulder. Other staples shall be permitted to be used as designed by a *registered design professional*. Staples into preservative-treated wood shall be stainless steel.

g. Staples shall be firmly driven diagonally across mesh intersections at the spacing indicated.

h. For walls with a different plaster on each side, the lower value shall be used.

i. Except as necessary to transfer roof or floor loads to the plaster skins in accordance with Section N105.9.

j. The building official is authorized to require a cube compression test to demonstrate a minimum 100 psi compressive strength.

k. The building official is authorized to require a compression test to demonstrate a minimum 1000 psi compressive strength.

l. Lime plaster shall use hydraulic or natural hydraulic lime. The building official is authorized to require a cube compression test to demonstrate a minimum 600 psi compressive strength.

m. The building official is authorized to require a cube compression test to demonstrate a minimum 1400 psi compressive strength.

TABLE N105.15
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR PLASTERED STRAWBALE WALLS[a]

DESIGNATION	PLASTER[b]		SILL PLATES[d]	ANCHOR[d] BOLTS (on center)	MESH[e]	STAPLES[f, g, h] (on center)	ALLOWABLE SHEAR[i, j, k] (plf)
	TYPE	THICK-NESS (each side)					
A1	Clay[m]	1.5-in.	2 x 4	2 ft. 8 in.	None	None	60
A2	Clay[m]	1.5-in.	2 x 4	2 ft. 8 in.	2 in. by 2 in. high-density polypropylene	2-inches	140
A3	Clay[m]	1.5-in,	2 x 4	2 ft. 8 in.	2”x2”x14ga[l]	4-inches	180
B	Soil-cement[o]	1-in.	4 x 4	2 ft. 0 in	2 in. by 2 in. by 14ga[l]	2-inches	520
C1	Lime[n]	7/8-in.	2 x 4	2 ft. 8 in.	17 ga. woven wire	3-inches	330
C2	Lime[n]	7/8-in.	4 x 4	2 ft. 0 in.	2 in. by 2 in. by 14ga[l]	2-inches	450
D1	Cement-lime[o]	7/8-in.	4 x 4	2 ft. 8 in	17 ga. woven wire	2-inches	380
D2	Cement-lime[o]	7/8-in.	4 x 4	2 ft. 0 in.	2 in. by 2 in. by 14ga[l]	2-inches	520
E1	Cement[p]	7/8-in.	4 x 4	2 ft. 8 in.	2 in. by 2 in. by 14 ga[l]	2-inches	540
E2	Cement[p]	1.5-in.	4 x 4	2 ft. 0 in.	2 in. by 2 in. by 14ga[l]	2-inches	680

SI: 1 inch=25.4 mm, 1 pound per foot = 14.5939 N/m

a. Bales shall be not less than 15 inches thick.

b. Plasters shall comply with Sections N106.7 through N106.12 for makeup and thickness, with Section N105.8.1 for straightness, and with Section N105.10 for support.

c. Sill plates shall be Douglas fir-larch or southern pine and shall be preservative-treated where required by the *International Building Code*. Multiply allowable shear value by .82 for other species with specific gravity of .42 or greater, or by .65 for all other species.

d. Anchor bolts shall be 5/8-inch diameter with 2-inch by 2-inch by 3/16-inch washers, with not less than 7-inch embedment in concrete or masonry foundation. Anchor bolts or other fasteners into framed floors shall be engineered.

e. Mesh shall run continuous vertically from sill plate to top plate, roof or floor beam, or roof or floor bearing assembly, or shall lap not less than 12-inches. Horizontal laps shall be a not less than 4-inches. Steel mesh shall be galvanized. Galvanized steel mesh shall be separated from preservative-treated wood by grade D paper, 15# roofing felt, or other *approved* barrier.

f. Staples shall be gun staples, stainless steel or electro-galvanized, 16 gauge with 1 ¼-inch legs, 7/16-inch crown; or manually driven staples, galvanized 15 gauge with 7/8-inch legs, 3/16-inch inner spread and rounded shoulder. Other staples shall be permitted to be used as designed by a registered design professional. Staples into preservative-treated wood shall be stainless steel.

g. Staples at spacing indicated are to boundary conditions, including sill plates, and top plate, roof or floor beam, or roof or floor bearing assembly,

h. Staples shall be firmly driven diagonally across mesh intersections at spacing indicated.

i. Values shown are for aspect ratios of 1:1 or less. Reduce values shown to 50 percent for the limit of a 2:1 aspect ratio. Linear interpolation shall be permitted for ratios between 1:1 and 2:1. The full value shown shall be used for aspect ratios greater than 1:1, where an additional layer of mesh is installed at the base of the wall to a height where the remainder of the wall has an aspect ratio of 1:1 or less, and the second layer of mesh is fastened to the sill plate with the required stapling, and the sill bolt spacing is decreased with linear interpolation between1:1 and 2:1.

j. For walls with a plaster Type A on one side and any other plaster type on the other side, a registered design professional shall show transfer of the design lateral load into the stiffer Type B, C, D, or E plaster only, and 50% of the allowable shear value shown for that wall type shall be used.

k. These values are permitted to be increased 40 percent for wind design.

l. 16 gauge mesh shall be permitted to be used with a reduction to 0.60 of the allowable shear values shown.

m. The building official is authorized to require a cube compression test demonstrating not less than 600 psi compressive strength.

n. Lime plaster shall use hydraulic or natural hydraulic lime. The building official is authorized to require a cube compression test demonstrating not less than 600 psi compressive strength.

o. The building official is authorized to require a cube compression test demonstrating not less than 1000 psi compressive strength.

p. The building official is authorized to require a cube compression test demonstrating not less than 1400 psi compressive strength.

SECTION N106
FINISHES

N106.1 General. Finishes applied to strawbale walls shall be any type permitted by the *International Building Code*, and shall comply with this section and with Chapters 14 and 25 unless stated otherwise in this section.

N106.2 Purpose, and where required. Strawbale walls shall be finished so as to provide mechanical protection, fire resistance, restrict the passage of air through the bales, and protect them from weather in accordance with this appendix and the *International Building Code*.

> **Exception:** Truth windows shall be permitted where a fire-resistive rating is not required. Weather-exposed truth windows shall be fitted with a weather-tight cover.

N106.3 Vapor retarders. Class I and Class II vapor retarders shall not be used on a strawbale walls, nor shall any other material be used that has a vapor permeance rating of less than 5 perms, except as permitted or required elsewhere in this appendix, or as *approved* and demonstrated to be necessary by a *registered design professional*.

N106.4 Plaster. Plaster applied to bales shall be of any type described in Section N106, and as required or limited in this appendix.

N106.5 Plaster and membranes. Plaster shall be applied directly to strawbale walls to facilitate transpiration of moisture from the bales, and to secure a mechanical bond between the skin and the bales, except where a membrane is allowed or required elsewhere in this appendix. Structural bale walls shall have no membrane between straw and plaster, or shall have attachment through the bale wall from one plaster skin to the other in accordance with an approved engineered design.

N106.6 Lath and mesh for plaster. The surface of the straw bales functions as lath, and no other lath or mesh shall be required, except as required for tensile or shear strength in structural applications as required in Table N105.14, Table N105.15, or by an *approved* engineered design.

N106.7 Plaster on non-structural walls. Plaster on non-structural walls shall be in accordance with Section N106.9, N106.10, N106.11, N106.12, N106.13 or N106.14.

N106.8 Plaster on structural walls. Plaster on structural walls shall comply with Section N106.9, N106.10, N106.11, N106.12, N106.13 or N106.14. Plaster on load-bearing walls shall also comply with Table N105.14. Plaster on shear walls shall also comply with Table N105.15.

N106.9 Clay plaster. Clay plaster shall comply with Sections N106.9.1 through N106.9.6.

N106.9.1 General. Clay plaster shall be any plaster having a clay or clay soil binder. Such plaster shall contain sufficient clay to fully bind the plaster, sand or other inert granular material, and shall be permitted to contain reinforcing fibers. Reinforcing fibers shall include, but shall not be limited to, chopped straw, sisal, and animal hair.

N106.9.2 Mesh. Clay plaster shall not be required to contain reinforcing mesh except as required in Table N105.15. Where provided, mesh shall be natural fiber, corrosion-resistant metal, nylon mesh, or high-density polypropylene.

N106.9.3 Thickness and coats. Clay plaster shall be a minimum 1 inch (25 mm) thick, unless required to be thicker for structure or fire-resistance, as described elsewhere in this appendix, and shall be applied with in not less than two coats.

N106.9.4 Rain-exposed. Clay plaster, where exposed to rain, shall be finished with lime wash, linseed oil, or other *approved* erosion resistant finish.

N106.9.5 Prohibited finish coat. Cement plaster shall not be permitted as a finish coat over clay plasters.

N106.9.6 Additives. Additives shall be permitted to increase the plaster's workability, durability, strength, or water resistance.

N106.10 Soil-cement plaster. Soil-cement plaster shall comply with Sections N106.10.1 through N106.10.3.

N106.10.1 General. Soil-cement plaster shall be comprised of soil (free of organic matter), sand, and not less than10 percent Portland cement by volume, and shall be permitted to contain reinforcing fibers.

N106.10.2 Mesh. Soil-cement plaster shall use any corrosion-resistant metal mesh permitted by the *International Building Code*, or as required in Section N105 where used on a structural wall.

N106.10.3 Thickness. Soil-cement plaster shall be not less than 1 inch (25 mm) thick.

N106.11 Gypsum plaster. Gypsum plaster shall comply with Section 2511 of the *International Building Code*. Gypsum plaster shall be limited to use on interior surfaces, and on non-structural walls, except as an interior finish coat over a structural plaster that complies with this appendix.

N106.12 Lime plaster. Lime plaster shall comply with Sections N106.12.1 and N106.12.2.

N106.12.1 General. Lime plaster is any plaster whose binder is comprised of calcium hydroxide (CaOH) including Type N or Type S hydrated lime, hydraulic lime, natural hydraulic lime, or quicklime. Hydrated lime plasters shall comply with ASTM C 206. Quicklime plasters shall comply with ASTM C 5. Lime plaster shall be permitted to be applied in 2 coats, provided that the combined thickness is at least 7/8 inch (22 mm), and each coat is not greater than 1/2 inch (13 mm) thick.

N106.12.2 On structural walls. Lime plaster on structural strawbale walls in accordance with Table N105.14 or Table N105.15 shall use hydraulic or natural hydraulic lime.

N106.13 Cement-lime plaster. Cement-lime plaster shall be plaster mixes CL or FL as described in ASTM C 926. Cement-lime plaster shall be permitted to be applied in 2 coats, provided the combined thickness is at least 7/8 inch (22 mm) thick, and each coat is not greater than 1/2 inch (13 mm) thick.

N106.14 Cement plaster. Cement plaster shall comply with Section 2512 of the *International Building Code*, except that the amount of lime in all plaster coats shall be not less than 1 part lime to 6 parts cement to allow a minimum acceptable vapor permeability. The plaster shall be permitted to be applied in 2 coats, provided the combined thickness is at least 7/8 inch (22 mm), and each coat is not greater than 1/2 inch (13 mm) thick. The combined thickness of all plaster coats shall be not more than 1 1/2 inch (38 mm) thick.

N106.15 Finishes over plaster. Other finishes, as permitted elsewhere in this section and the *International Building Code*, shall be permitted to be applied over the plaster, except as prohibited in Section N106.16.

N106.16 Prohibited plasters and finishes. Any plaster or finish with a singular or cumulative perm rating less than 5 perms shall be prohibited on straw bale walls, except where approved and demonstrated to be necessary by a *registered design professional*, or as required elsewhere in this appendix.

N106.17 Separation of wood and plaster. Where wood framing or wood sheathing occurs in strawbale walls, such wood surfaces shall be separated from exterior plaster with No. 15 asphalt felt, grade D paper, or other *approved* material in accordance with Section 1404.2 of the *International Building Code*, except where the wood is preservative-treated or naturally durable.

Exception: Exterior clay plasters shall not be required to be separated from wood.

SECTION N108
THERMAL INSULATION

N108.1 R-value. The unit R-value of a strawbale wall with bales laid flat is R-1.3 per inch, and with bales on-edge is R-2 per inch.

PART II – IBC FIRE SAFETY

SECTION N107
FIRE RESISTANCE

N107.1 Fire-resistance rating. Fire-resistance ratings for strawbale walls shall be established in accordance with Section N107.1.1 or N107.1.2, or shall be determined in accordance with Section 703.2 or 703.3 of the *International Building Code*.

N107.1.1 1-hour rated clay plastered wall. 1-hour fire-resistance-rated nonload-bearing clay plastered strawbale walls shall comply with all of the following:

1. Bales shall be laid flat or on-edge in a running bond. Gaps shall be fire-stopped with straw-clay,
2. Bales shall maintain thickness of not less than 18 inches (457 mm),

3. Clay plaster on each side of the wall shall be not less than 1 inch (25 mm) thick and shall be comprised of a mixture of 3 parts clay, 2 parts chopped straw, and 6 parts sand, or an alternative *approved* clay plaster.
4. Plaster application shall be in accordance with Section N106.9 for the number and thickness of coats.

N107.1.2 2-hour rated cement plastered wall. 2-hour fire-resistance-rated nonload-bearing cement plastered strawbale walls shall comply with all of the following:

1. Bales shall be laid flat or on-edge in a running bond. Gaps shall be fire-stopped with straw-clay.
2. Bales shall maintain a thickness of not less than 14 inches (356 mm).
3. 1 1/2 inch (38 mm) by 17 gauge galvanized woven wire mesh shall be attached to wood members with 1 1/2 inch (38 mm) staples at 6 inches (406 mm) on center. 9 gauge U-pins with minimum 8 inch (203 mm) legs shall be installed in the field at 18 inches (457 mm) on center.
4. Cement plaster on each side of the wall shall be not less than 1 inch (25 mm) thick.
5. Plaster application shall be in accordance with Section N106.14 for the number and thickness of coats.

N107.2 Openings in rated walls. Openings and penetrations in bale walls required to have a fire-resistance rating shall satisfy the same requirements for openings and penetrations as prescribed in the *International Building Code*.

N107.3 Clearance to fireplaces and chimneys. Strawbale surfaces adjacent to fireplaces or chimneys shall have a minimum 3/8 inch (10 mm) thick plaster coat of any type permitted by this section, and shall maintain the specified clearances to the plaster finish as required to combustibles in *International Building Code* Chapter 21, Sections 2111, 2112, and 2113, or as required by manufacturer's installation instructions, whichever is more restrictive.

N107.4 Type of construction. Buildings or portions thereof utilizing strawbale walls in accordance with this appendix shall be classified as Type V-B construction. Strawbale walls constructed in compliance with Section N107.1.1 or N107.1.2 shall be permitted wherever combustible walls of the same fire-resistance are allowed by Chapter 6 of the *International Buildlng Code*. Strawbale walls with any finish allowed by this appendix shall be permitted wherever non-rated combustible walls are allowed by the *International Building Code*.

Reason: Strawbale construction has proven to be a safe, durable, resource efficient, and fully viable method of construction. However, the International Building Code does not contain a section on strawbale construction, which has been an impediment to this construction system's proper and broader use.

First practiced in Nebraska in the late 1800's, with buildings over 100 years old still in service, strawbale construction was rediscovered in the 1980's in the American southwest. Since then it has been further developed and explored, including considerable testing and research regarding structural performance (under vertical and lateral loads), moisture, fire, and its thermal and acoustic properties.

Currently only Oregon and New Mexico have adopted statewide strawbale building codes. California has legislated strawbale construction guidelines that are voluntarily adopted at the local level. In addition, nine U.S. cities or counties have adopted strawbale building codes. Three countries outside the United States – Germany, France, and Belarus - have limited strawbale building codes.

Most of the strawbale building codes that do exist are derived from the first such code, created for and adopted by Tucson / Pima County, Arizona in 1996. Much experience, testing, and research since then have proven these codes to be deficient. They are often either too restrictive, or not restrictive enough, and in some cases don't address important issues at all.

Although strawbale codes are both few and flawed, strawbale buildings are now found in 49 of the 50 United States, and strawbale construction is practiced in over 45 countries throughout the world and in every climate. There are an estimated 600-1000 strawbale buildings in California alone. The strawbale buildings in the U.S. include residences, schools, office buildings, wineries, multi-story buildings, buildings over 10,000 sq.ft in floor area, load-bearing strawbale structures, and structures in areas of high seismic risk (plastered strawbale walls are particularly resistant to earthquakes). The practice of, and the desire to utilize strawbale construction, continues to increase and promises to accelerate as we face increased pressure on our environment and natural resources.

There is great need for a comprehensive strawbale code, with full benefit of the experience and knowledge that has been gained to date about this method of construction. The following proposed Strawbale Construction appendix for the IBC was created to fulfill this need. It is based on the collective experience of the design, construction, and testing of strawbale buildings over 20 years by architects, engineers, builders, and academics throughout the U.S., Canada, and other countries throughout the world. The testing, research, and comprehensive understanding of the performance of strawbale buildings are summarized in the book

Design of Straw Bale Buildings (B.King, et al, 2006, Green Building Press). Testing, research reports, and other supporting documentation are available for viewing and download at: http://www.ecobuildnetwork.org/strawbale-construction-code-supporting-documentation

As lead author of the proposed appendix, and as a licensed architect for 25 years, I have been involved in the design, construction, testing, and research of strawbale buildings since 1995. In 2001 I spearheaded legislation and revisions to the current California Guidelines for Straw-Bale Structures. The proposed Strawbale Construction appendix for the IBC has benefited from numerous peer reviews by experienced, licensed design and building professionals over the course of more than five years. It would serve designers, builders, owners, inhabitants, and building officials alike in the construction and utilization of strawbale buildings.

Supporting Documentation: List of selected documents available via the above link

Load-Bearing Straw Bale Construction – A summary of worldwide testing and experience, B.King, PE
Testing of Straw Bale Walls with Out-of-Plane Loads – K.Donahue, SE
In-Plane Cyclic Tests of Plastered Straw Bale Wall Assemblies – C.Ash, M.Aschheim, PE, D.Mar, SE
Structural Testing of Plastered Straw Bale Wall Assemblies – K.Lerner, Architect, K.Donahue, SE
Seismic Design Factors and Allowable Shears for Strawbale Wall Assemblies – S. Jalali, M. Aschheim, PE
Shake Table Test Video of Full Scale Straw Bale Building Specimen – D.Donovan, PE
Moisture Properties of Plaster and Stucco for Strawbale Buildings – J.Straube, PE
Monitoring of Hygrothermal Performance of Strawbale Walls – J.Sraube, PE, C.Schumacher
ASTM E119 1-Hour Fire Resistance Test of a Non-Loadbearing Straw Bale Wall with Clay Plaster
ASTM E119 2-Hour Fire Resistance Test of a Non-Loadbearing Straw Bale Wall with Cement Plaster
ASTM E119 Fire Tests - Video
Thermal Performance of Straw Bale Wall Systems (incl. Oak Ridge Lab test results) – N.Stone
Support Letters from Licensed Practitioners: Letters from 2 Structural Engineers, 4 Civil Engineers, 1 Professor of Civil Engineering, 7 Architects

Cost Impact: The code change proposal will not increase the cost of construction.

S315-12
PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE – FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX N (NEW)-S-HAMMER-AB2-15-12.doc

S316–12
Chapter 24 (NEW), 202

Proponent: Proponent: Martin Hammer, Architect, representing California Straw Building Association, Colorado Straw Bale Association, Straw Bale Construction Association-New Mexico, Ontario Straw Bale Building Coalition, Development Center for Appropriate Technology, Environmental Building Network (mfhammer@pacbell.net)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC STRUCTURAL

Add new text as follows:

CHAPTER 24
STRAWBALE CONSTRUCTION

SECTION 2401
GENERAL

2401.1 Scope. This Chapter shall govern the use of baled straw as a building material.

SECTION 2402
DEFINITIONS

2402.1 Definitions. The following terms are defined in Chapter 2.

BALE.
CLAY.
CLAY SLIP.
FLAKE.
LAID FLAT.
MESH.
ON-EDGE.
PIN.
PRE-COMPRESSION.
REINFORCED PLASTER.
RUNNING BOND.
SHEAR WALL, STRAWBALE.
SKIN.
STACK BOND.
STRAW.
STRAW BALE.
STRAWBALE.
STRAW-CLAY.
TIE.
TRUTH WINDOW.
WALL, LOAD-BEARING.
WALL, NONLOAD-BEARING
WALL, NONSTRUCTURAL.
WALL, STRUCTURAL.

SECTION 2403
BALES

2403.1 Types of straw. Bales shall be composed of straw from wheat, rice, rye, barley, or oat.

2403.2 Shape. Bales shall be rectangular in shape.

2403.3 Size. Bales shall have a minimum height and thickness of 12 inches (305 mm), except as otherwise permitted or required in this chapter. Bales used within a continuous wall shall be of consistent height and thickness to ensure even distribution of loads within the wall system.

2403.4 Ties. Bales shall be confined with synthetic fiber, natural fiber, or metal ties sufficient to maintain required bale density. Ties shall be at least 3 inches (76 mm) and not more than 6 inches (152 mm) from bale faces and shall be spaced not more than 12 (305 mm) inches apart. Bales with broken ties shall be retied with sufficient tension to maintain required bale density.

2403.5 Moisture content. The moisture content of bales at the time of application of the first coat of plaster or the installation of another finish shall not exceed 20 percent of the weight of the bale. The moisture content of bales shall be determined by use of a moisture meter designed for use with baled straw or hay, equipped with a probe of sufficient length to reach the center of the bale. At least 5 percent and not less than ten bales used shall be randomly selected and tested.

2403.6 Density. Bales shall have a minimum dry density of 6.5 pounds per cubic foot (92 kg/cubic meter). The dry density shall be calculated by subtracting the weight of the moisture in pounds (kg) from the actual bale weight and dividing by the volume of the bale in cubic feet (cubic meters). At least 2 percent and not less than five bales to be used shall be randomly selected and tested on site.

2403.7 Partial bales. Partial bales made after original fabrication shall be retied with ties complying with 2403.4.

SECTION 2404
MOISTURE CONTROL

2404.1 General. All weather-exposed bale walls and bale walls enclosing showers or steam rooms, shall be protected from water damage and moisture intrusion in accordance with this section.

2404.2 Water-resistant barriers and vapor permeance ratings. Plastered bale walls shall be permitted to be constructed without any membrane barrier between straw and plaster to facilitate transpiration of moisture from the bales, or to secure a structural bond between straw and plaster, except as allowed or required elsewhere in this chapter. Where a water-resistant barrier is placed behind the exterior finish, it shall have a minimum vapor permeance rating of 5 perms, except as permitted or required elsewhere in this chapter, or as demonstrated to be necessary by a *registered design professional*. Wall finishes shall be vapor permeable or have an equivalent vapor permeance rating of a Class III vapor retarder

2404.3 Horizontal surfaces. Bale walls and other bale elements shall have a moisture barrier at all horizontal surfaces exposed to weather. This moisture barrier shall be of a material and installation that will prevent water from entering the wall system. Horizontal surfaces include, but are not limited to, exterior window sills, sills at exterior niches, and buttresses. The finish material at all such surfaces shall be sloped not less than 1 unit vertical in 12 units horizontal (8-percent slope) and shall drain away from all bale walls and elements. Where the moisture barrier is below the finish material, it shall be sloped not less than 1 unit vertical in 12 units horizontal (8-percent slope) and shall drain to the outside surface of the bale's vertical finish.

2404.4 Bale and concrete separation. A sheet or liquid applied Class II vapor retarder shall be installed between bales and supporting concrete or masonry. The bales shall be separated from the vapor retarder a minimum of 3/4" (19 mm), and that space shall be filled with an insulating material such as wood or rigid insulation, or a material allowing vapor dispersion, such as gravel. Sill plates in structural walls shall comply with Table 2405.14 and Table 2405.15. Where bales abut a concrete or masonry wall that retains earth, a Class II vapor retarder shall be provided between such wall and the bales.

2404.5 Separation of bales and earth. Bales shall be separated from earth a minimum of 8" (203 mm).

2404.6 Separation of exterior plaster and earth. Exterior plaster applied to straw bales shall be a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas.

2404.7 Shower walls, steam rooms. Bale walls enclosing showers, tub shower combinations, or steam rooms shall be protected by a water-resistive barrier or by a Class I or Class II vapor retarder.

SECTION 2405
STRUCTURAL USE

2405.1 Scope. This section shall apply to structural strawbale walls. Sections 2405.11, 2405.12, and 2405.16 shall also apply to nonstructural strawbale walls.

2405.2 General. An approved engineered design in accordance with Section 2405 and the *International Building Code* shall be provided for buildings or portions thereof using structural strawbale walls.

2405.3 Foundations. Foundations for strawbale walls shall be any type permitted by, and shall be designed in accordance with, the *International Building Code*.

2405.4 Building height and stories. Building height shall not exceed 35 feet and the limits contained in Table 2405.13. Structural use of strawbale walls shall be permitted in multi-story buildings where:

1. Complete vertical and lateral load paths are demonstrated by an *approved* engineered design.
2. Strawbale walls interrupted by floor assemblies are designed and detailed by a *registered design professional*.

2405.5 Configuration of bales. Bales in structural walls shall be laid flat or on-edge and in a running bond or stack bond, except that bales in structural walls with unreinforced plasters shall be laid in a running bond only.

2405.6 Pre-compression of load-bearing strawbale walls. Prior to application of plaster, walls designed to be load-bearing shall be pre-compressed by a uniform load of not less than 100 pounds per linear foot.

2405.7 Voids and stuffing. Voids between bales in structural strawbale walls shall not exceed 4 inches (102 mm) in width, and such voids shall be stuffed with flakes of straw or straw-clay, before application of finish.

2405.8 Plaster skins. Plaster skins on structural walls shall be of any type permitted by Section 2406, except gypsum plaster, and shall be in accordance with Tables 2405.14 and 2405.15.

2405.8.1 Straightness. Plaster skins on structural strawbale walls shall be straight, as a function of the bale wall surfaces they are applied to, as follows:

1. As measured across the face of a bale, straw bulges shall not protrude more than 3/4 inch (19 mm) across 2 feet (610 mm) of its height or length.
2. As measured across the face of a bale wall, straw bulges shall not protrude from the vertical plane of a bale wall more than 2 inches (51 mm) over 8 feet (2438 mm).
3. The vertical face of adjacent bales shall not be offset more than 1/2 inch (13 mm)

2405.8.2 Plaster and membranes. Structural strawbale walls shall not have a membrane between straw and plaster, or shall have attachment through the bale wall from one plaster skin to the other in accordance with an *approved* engineered design.

2405.9 Transfer of loads to and from plaster skins. Where plastered strawbale walls are used to support superimposed vertical loads, such loads shall be transferred to the plaster skins by continuous direct bearing or by an *approved* engineered design. Where plastered strawbale walls are used to resist in-plane lateral loads, such loads shall be transferred via the reinforcing mesh from the structural member or assembly above and to the sill plate in accordance with Table 2405.15, or in accordance with an *approved* engineered design.

2405.10 Support of plaster skins. Plaster skins for structural strawbale walls shall be continuously supported along their bottom edge to facilitate the transfer of loads to the foundation system. Supports shall include, but shall not be limited to: a concrete or masonry stem wall, a concrete slab on grade, a wood-framed floor adequately blocked, with an *approved* engineered design, or a steel angle adequately anchored, with an *approved* engineered design. A conventional metal or plastic weep screed is not an acceptable support.

2405.11 Unrestrained wall height. Strawbale walls shall not exceed the ratios of stacked bale height to bale thickness between restraints, as stated in Section 2505.12, except where an *approved* engineered design demonstrates the wall will resist buckling from superimposed vertical loads and out-of-plane design loads.

2405.12 Resistance to out-of-plane lateral loads. Structural and non-structural strawbale walls shall be considered capable of resisting the out-of-plane loads prescribed in the *International Building Code* with the following limitations and requirements, except where an *approved* engineered design is provided:

1. Walls with unreinforced plasters or a non-plaster finish, and without pins in accordance with 2405.12.4, or other *approved* means of out-of-plane bracing, shall not exceed a 5:1 ratio of stacked bale height to bale thickness.
2. Clay plaster walls with reinforced plasters, or pins in accordance with 2405.12 Item 4, or other *approved* means of out-of-plane bracing, shall not exceed the ratio indicated in Equation 24-1. Plaster reinforcement shall be any type described in Table 2405.15 with staples spaced not more than 6 inches (152 mm) on center.

$H^2/T = 65$ **(Equation 24-1)**

Where:

H = stacked bale height
T = bale thickness
H and T are measured in feet. (H^2/T = 19,800 when H and T are measured in mm)

3. Cement, cement-lime, lime, or soil cement plaster walls with reinforced plasters, or pins in accordance with 2405.12 Item 4, or other *approved* means of out-of-plane bracing, shall not exceed the ratio indicated in Equation 24-2. Plaster reinforcement shall be any type described in Table 2405.15 with staples spaced not more than 6 inches (152 mm) on center.

$H^2/T = 80$ **(Equation 24-2)**

Where:

H = stacked bale height
T = bale thickness
H and T are measured in feet. (H^2/T = 24,400 when H and T are measured in mm)

4. Pins shall be in accordance with an *approved* engineered design, or shall comply with the following: Pins shall be 3/8 inch (10 mm) diameter steel, 3/4 inch diameter (19 mm) wood, or 1/2 inch diameter (13 mm) bamboo. Pins shall be external or internal. External pins shall be installed on both sides of the wall spaced not more than 24 inches (610 mm) on center. External pins shall have full lateral bearing on the sill plate and the roof- or floor-bearing member, and shall be tightly tied through the wall to an opposing pin with ties spaced not more than 30 inches (762 mm) apart and not more than 15 inches (381 mm) from each end. Internal pins shall be installed vertically not more than 24 inches (610 mm) on center in the center third of the bales, and shall extend from top course to bottom course. The bottom course shall be similarly connected to its support and the top course shall be similarly connected to the roof- or floor-bearing member above with pins or other *approved* means. Internal pins shall be continuous or shall overlap through not less than one bale course.

2405.13 Design coefficients and factors for seismic design. The values given in Table 2405.13 shall apply to seismic design using strawbale shear walls detailed in accordance with Table 2405.15.

2405.14 Load-bearing strawbale walls. Load-bearing strawbale walls shall be in accordance with Table 2405.14 as part of an *approved* engineered design to support superimposed vertical loads.

2405.15 Strawbale shear walls. Strawbale shear walls shall be in accordance with Table 2405.13 as part of an *approved* engineered design to resist in-plane lateral loads. Other *approved* in-plane lateral load resisting systems shall be permitted to be used in combination with strawbale shear walls with apportionment of design loads as prescribed in the *International Building Code*.

2405.16 Connection of light-frame walls to strawbale walls. Light-frame walls perpendicular to, or at an angle to a straw bale wall assembly, shall be fastened to the bottom and top wood members of the strawbale wall in accordance with requirements for wood or cold-formed steel light-frame walls in the *International Building Code*, or the abutting stud shall be connected to alternating straw bale courses with a 1/2 inch (13mm) diameter steel, 3/4" diameter (19 mm) wood, or 5/8" diameter (16 mm) bamboo dowel, with minimum 8 inch (203 mm) penetration.

TABLE 2405.13
DESIGN COEFFICIENTS AND FACTORS FOR SEISMIC-FORCE-RESISTING SYSTEMS

Seismic-Force-Resisting System		**Response Modification Coefficient, *R*[1]**	**System Overstrength Factor, Omega[2]**	**Deflection Amplification Factor, *C***	**Structural System Limitations and Building Height (ft) Limits**				
					Seismic Design Category				
					B	C	D	E	F
A. Bearing Wall Systems									
Strawbale shear walls		3.5	3	3	25	25	15	15	15
B. Building Frame Systems									
Strawbale shear walls		4	3	3.5	35	35	25	25	25

[a] R reduces forces to a strength level, not an allowable stress level
[b] The tabulated value of the overstrength factor is permitted to be reduced by subtracting 0.5 for structures with flexible diaphragms, but shall not be taken s less than 2.0 for any structure.

TABLE 2405.14
ALLOWABLE GRAVITY LOADS (LBS./FOOT) FOR PLASTERED STRAWBALE WALLS

WALL DESIGNATION	PLASTER (both sides) Thickness each side	SILL PLATES[b,c]	ANCHOR[c] BOLTS (or other sill fastening)	MESH[d]	STAPLES[e,f,g]	ALLOWABLE BEARING CAPACITY[h] (plf)
A	Clay[j] 1-1/2”	c	c	None required[i]	None required[i]	400
B	Soil-cement[k] 1”	c	c	d	e,f,g	800
C	Lime[l] 7/8”	c	c	d	e,f,g	500
D	Cement-lime[k] 7/8”	c	c	d	e,f,g	800
E	Cement 7/8”	c	c	d	e,f,g	800

For SI: 1 inch=25.4mm, 1 pound per foot = 14.5939 N/m.

a. Plasters shall conform with Sections 2406.9 through 2406.12 for makeup and thickness, with Section 2405.8.1 for straightness, and with Section 2405.10 for support of plaster skins. Specified minimum plaster thicknesses are applied on each face of the wall.

b. Sill plates shall support and be flush with each face of the bale wall and shall be preservative-treated where required by the *International Building Code*..

c. For walls supporting gravity loads only or for non-structural walls, sill plates and fastening shall be in accordance with the requirements for wood framed walls in the *International Building Code*. See Table 2405.15 for requirements for shear walls.

d. Any metal mesh allowed by this section shall be installed throughout the plaster with minimum 4-inch laps and fastened per footnote e.

e. Staples shall be at maximum spacing of 2-inches o.c., to roof or floor bearing assembly, or as shown necessary to transfer loads into the plaster skins in accordance with Section 2405.9, and at a maximum spacing of 4-inches o.c. to sill plates.

f. Staples shall be gun staples, stainless steel or electro-galvanized, 16 gauge with 1 ¼-inch legs, 7/16-inch crown; or manually driven staples, galvanized 15 gauge with 7/8-inch legs, 3/16-inch inner spread and rounded shoulder. Other staples shall be permitted to be used as designed by a *registered design professional*. Staples into preservative-treated wood shall be stainless steel.

g. Staples shall be firmly driven diagonally across mesh intersections at the spacing indicated.

h. For walls with a different plaster on each side, the lower value shall be used.

i. Except as necessary to transfer roof or floor loads to the plaster skins in accordance with Section 2405.9.

j. The building official is authorized to require a cube compression test to demonstrate a minimum 100 psi compressive strength.

k. The building official is authorized to require a compression test to demonstrate a minimum 1000 psi compressive strength.

l. Lime plaster shall use hydraulic or natural hydraulic lime. The building official is authorized to require a cube compression test

m. to demonstrate a minimum 600 psi compressive strength.

n. The building official is authorized to require a cube compression test to demonstrate a minimum 1400 psi compressive strength.

TABLE 2405.15
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR PLASTERED STRAWBALE WALLS[a]

DESIGNATION	PLASTER[b]		SILL PLATES[d]	ANCHOR[d] BOLTS (on center)	MESH[e]	STAPLES[f, g, h] (on center)	ALLOWABLE SHEAR[i, j, k] (plf)
	TYPE	THICK-NESS (each side)					
A1	Clay[m]	1.5-in.	2 x 4	2 ft. 8 in.	None	None	60
A2	Clay[m]	1.5-in.”	2 x 4	2 ft. 8 in.	2 in. by 2 in. high-density polypropylene	2-inches	140
A3	Clay[m]	1.5-in.	2 x 4	2 ft. 8 in.	2”x2”x14ga[l]	4-inches	180
B	Soil-cement[o]	1-in.	4 x 4	2 ft. 0 in	2 in. by 2 in. by 14ga[l]	2-inches	520
C1	Lime[n]	7/8-in.	2 x 4	2 ft. 8 in.	17 ga. woven wire	3-inches	260
C2	Lime[n]	7/8-in.	4 x 4	2 ft. 0 in.	2 in. by 2 in. by 14ga[l]	2-inches	450
D1	Cement-	7/8-in.	4 x 4	2 ft. 8 in	17 ga.	2-inches	380

DESIGNATION	PLASTER[b]		SILL PLATES[d]	ANCHOR[d] BOLTS (on center)	MESH[e]	STAPLES[f, g, h] (on center)	ALLOWABLE SHEAR[i, j, k] (plf)
	TYPE	THICK-NESS (each side)					
	lime[o]				woven wire		
D2	Cement-lime[o]	7/8-in.	4 x 4	2 ft. 0 in.	2 in. by 2 in. by 14ga[l]	2-inches	520
E1	Cement[p]	7/8-in.	4 x 4	2 ft. 8 in.	2 in. by 2 in. by 14 ga[l]	2-inches	540
E2	Cement[p]	1.5-in.	4 x 4	2 ft. 0 in.	2 in. by 2 in. by 14ga[l]	2-inches	680

SI: 1 inch=25.4 mm, 1 pound per foot = 14.5939 N/m

a. Bales shall be a minimum of 15 inches thick.

b. Plasters shall comply with Sections 2406.7 through 2406.12 for makeup and thickness, with Section 2405.8.1 for straightness, and with Section 2405.10 for support.

c. Sill plates shall be Douglas fir-larch or southern pine and shall be preservative-treated where required by the *International Building Code*. Multiply allowable shear value by .82 for other species with specific gravity of .42 or greater, or by .65 for all other species.

d. Anchor bolts shall be 5/8-inch diameter with 2-inch by 2-inch by 3/16-inch washers, with not less than 7-inch embedment in concrete or masonry foundation. Anchor bolts or other fasteners into framed floors shall be engineered.

e. Mesh shall run continuous vertically from sill plate to top plate, roof or floor beam, or roof or floor bearing assembly, or shall lap a not less than 12-inches. Horizontal laps shall be not less than 4-inches. Steel mesh shall be galvanized. Galvanized steel mesh shall be separated from preservative-treated wood by grade D paper, 15# roofing felt, or other *approved* barrier.

f. Staples shall be gun staples, stainless steel or electro-galvanized, 16 gauge with 1 ¼-inch legs, 7/16-inch crown; or manually driven staples, galvanized 15 gauge with 7/8-inch legs, 3/16-inch inner spread and rounded shoulder. Other staples shall be permitted to be used as designed by a registered design professional. Staples into preservative-treated wood shall be stainless steel.

g. Staples at spacing indicated are to boundary conditions, including sill plates, and top plate, roof or floor beam, or roof or floor bearing assembly,

h. Staples shall be firmly driven diagonally across mesh intersections at spacing indicated.

i. Values shown are for aspect ratios of 1:1 or less. Reduce values shown to 50% for the limit of a 2:1 aspect ratio. Linear interpolation shall be permitted for ratios between 1:1 and 2:1. The full value shown shall be used for aspect ratios greater than 1:1, where an additional layer of mesh is installed at the base of the wall to a height where the remainder of the wall has an aspect ratio of 1:1 or less, and the second layer of mesh is fastened to the sill plate with the required stapling, and the sill bolt spacing is decreased with linear interpolation between1:1 and 2:1.

j. For walls with a plaster Type A on one side and any other plaster type on the other side, a registered design professional shall show transfer of the design lateral load into the stiffer Type B, C, D, or E plaster only, and 50% of the allowable shear value shown for that wall type shall be used.

k. These values are permitted to be increased 40 percent for wind design.

l. 16 gauge mesh shall be permitted to be used with a reduction to 0.60 of the allowable shear values shown.

m. The building official is authorized to require a cube compression test demonstrating not less than 600 psi compressive strength.

n. Lime plaster shall use hydraulic or natural hydraulic lime. The building official is authorized to require a cube compression test demonstrating not less than 600 psi compressive strength.

o. The building official is authorized to require a cube compression test demonstrating not less than 1000 psi compressive strength.

p. The building official is authorized to require a cube compression test demonstrating not less than 1400 psi compressive strength.

SECTION 2406
FINISHES

2406.1 General. Finishes applied to strawbale walls shall be any type permitted by the *International Building Code*, and shall comply with this section and with Chapters 14 and 25 unless stated otherwise in this section.

2406.2 Purpose, and where required. Strawbale walls shall be finished so as to provide mechanical protection, fire resistance, restrict the passage of air through the bales, and protect them from weather in accordance with this chapter and the *International Building Code*.

Exception: Truth windows are permitted where a fire-resistive rating is not required. Weather-exposed truth windows shall be fitted with a weather-tight cover.

2406.3 Vapor retarders. Class I and Class II vapor retarders shall not be used on a strawbale walls, nor shall any other material be used that has a vapor permeance rating less than 5 perms, except as permitted or required elsewhere in this chapter, or as *approved* and demonstrated to be necessary by a *registered design professional*.

2406.4 Plaster. Plaster applied to bales shall be of any type described in Section 2406, and as required or limited in this chapter.

2406.5 Plaster and membranes. Plaster shall be applied directly to strawbale walls to facilitate transpiration of moisture from the bales, and to secure a mechanical bond between the skin and the bales, except where a membrane is allowed or required elsewhere in this chapter. Structural bale walls shall have no membrane between straw and plaster, or shall have attachment through the bale wall from one plaster skin to the other in accordance with an approved engineered design.

2406.6 Lath and mesh for plaster. The surface of the straw bales functions as lath, and no other lath or mesh shall be required, except as required for tensile or shear strength in structural applications as required in Table 2405.14, Table 2405.15, or by an *approved* engineered design.

2406.7 Plaster on non-structural walls. Plaster on non-structural walls shall be in accordance with Section 2406.9, 2406.10, 2406.11, 2406.12, 2406.13 or 2406.14.

2406.8 Plaster on structural walls. Plaster on structural walls shall comply with Section 2406.9, 2406.10, 2406.11, 2406.12, 2406.13 or 2406.14. Plaster on load-bearing walls shall also comply with Table 2405.14. Plaster on shear walls shall also comply with Table 2405.15.

2406.9 Clay plaster. Clay plaster shall comply with Sections 2406.9.1 through 2406.9.6.

2406.9.1 General. Clay plaster shall be any plaster having a clay or clay soil binder. Such plaster shall contain sufficient clay to fully bind the plaster, sand or other inert granular material, and shall be permitted to contain reinforcing fibers. Reinforcing fibers shall include, but shall not be limited to, chopped straw, sisal, and animal hair.

2406.9.2 Mesh. Clay plaster shall not be required to contain reinforcing mesh except as required in Table 2405.15. Clay plaster shall be permitted to contain natural fiber mesh, corrosion-resistant metal mesh, nylon mesh, or high-density polypropylene mesh.

2406.9.3 Thickness and coats. Clay plaster shall be not less than 1 inch (25 mm) thick, unless required to be thicker for structure or fire-resistance, as described elsewhere in this chapter, and shall be applied with a minimum of two coats.

2406.9.4 Rain-exposed. Clay plaster, where exposed to rain, shall be finished with lime wash, linseed oil, or other *approved* erosion resistant finish.

2406.9.5 Prohibited finish coat. Cement plaster is prohibited as a finish coat over clay plasters.

2406.9.6 Additives. Additives shall be permitted to increase the plaster's workability, durability, strength, or water resistance.

2406.10 Soil-cement plaster. Soil-cement plaster shall comply with Sections 2406.10.1 through 2406.10.3.

2406.10.1 General. Soil-cement plaster shall be comprised of soil (free of organic matter), sand, and not less than 10 percent Portland cement by volume, and shall be permitted to contain reinforcing fibers.

2406.10.2 Mesh. Soil-cement plaster shall use any corrosion-resistant metal mesh permitted by the *International Building Code*, or as required in Section 2405 where used on a structural wall.

2406.10.3 Thickness. Soil-cement plaster shall be a minimum of 1 inch (25 mm) thick.

2406.11 Gypsum plaster. Gypsum plaster shall comply with Section 2511 of the *International Building Code*. Gypsum plaster shall be limited to use on interior surfaces, and on non-structural walls, except as an interior finish coat over a structural plaster that complies with this chapter.

2406.12 Lime plaster. Lime plaster shall comply with Sections 2406.12.1 and 2406.12.2.

2406.12.1 General. Lime plaster is any plaster whose binder is comprised of calcium hydroxide (CaOH) including Type N or Type S hydrated lime, hydraulic lime, natural hydraulic lime, or quicklime. Hydrated lime plasters shall comply with ASTM C 206. Quicklime plasters shall comply with ASTM C 5. Liime plaster shall be permitted to be applied in 2 coats, provided that the combined thickness is at least 7/8 inch (22 mm), and each coat is no greater than 1/2 inch (13 mm).

2406.12.2 On structural walls. Lime plaster on structural strawbale walls in accordance with Table 2405.14 or Table 2405.15 shall use hydraulic or natural hydraulic lime.

2406.13 Cement-lime plaster. Cement-lime plaster shall be plaster mixes CL or FL as described in ASTM C 926. Cement-lime plaster shall be permitted to be applied in 2 coats, provided the combined thickness is at least 7/8 inch (22 mm) thick, and each coat is not greater than 1/2 inch (13 mm) thick.

2406.14 Cement plaster. Cement plaster shall comply with Section 2512 of the *International Building Code*, except that the amount of lime in all plaster coats shall be not less than 1 part lime to 6 parts cement to allow a minimum acceptable vapor permeability. The plaster shall be permitted to be applied in 2 coats, provided the combined thickness is at least 7/8 inch (22 mm), and each coat is not greater than 1/2 inch (13 mm) thick. The combined thickness of all plaster coats shall be not more than 1 1/2 inch (38 mm) thick.

2406.15 Finishes over plaster. Other finishes, as permitted elsewhere in this section and the *International Building Code*, shall be permitted to be applied over the plaster, except as prohibited in Section 2406.16.

2406.16 Prohibited plasters and finishes. Any plaster or finish with a singular or cumulative perm rating less than 5 perms shall be prohibited on straw bale walls, except where approved and demonstrated to be necessary by a *registered design professional*, or as required elsewhere in this chapter.

2406.17 Separation of wood and plaster. Where wood framing or wood sheathing occurs in strawbale walls, such wood surfaces shall be separated from exterior plaster with No. 15 asphalt felt, grade D paper, or other *approved* material in accordance with Section 1404.2 of the *International Building Code*, except where the wood is preservative-treated or naturally durable.

> **Exception:** Exterior clay plasters shall not be required to be separated from wood.

SECTION 2408
THERMAL INSULATION

2408.1 R-value. The unit R-value of a strawbale wall with bales laid flat is R-1.3 per inch, and with bales on-edge is R-2 per inch.

Revise as follows:

SECTION 202
DEFINITIONS

BALE. Equivalent to straw bale.
CLAY. Inorganic soil with particle sizes less than 0.00008 in. (0.002 mm) having the characteristics of high to very high dry strength and medium to high plasticity.
CLAY SLIP. A suspension of clay particles in water.
FLAKE. An intact section of compressed straw removed from an untied bale.
LAID FLAT. The orientation of a bale with its largest faces horizontal, its longest dimension parallel with the wall plane, its ties concealed in the unfinished wall and its straw lengths oriented across the thickness of the wall.
MESH. An openwork fabric of linked strands of metal, plastic, or natural or synthetic fiber, embedded in plaster to provide tensile reinforcement or bonding.
ON-EDGE. The orientation of a bale with its largest faces vertical, its longest dimension parallel with the wall plane, its ties on the face of the wall, and its straw lengths oriented vertically.
PIN. Metal rod, wood dowel, or bamboo, driven into or through-tied on the surface of stacked bales for purpose of connection or stability.
PRE-COMPRESSION. Vertical compression of stacked bales before application of finish.
REINFORCED PLASTER. A plaster containing mesh reinforcement.
RUNNING BOND. The placement of *masonry units* or straw bales such that the *head joints* in successive courses are offset at least one-quarter the unit or bale length.
STRAWBALE SHEAR WALL. A strawbale wall designed to resist lateral forces parallel to the plane of the wall in accordance with Section 2405.15.
SKIN. The compilation of plaster and reinforcing, if any, applied to the surface of stacked straw bales.
STACK BOND. The placement of *masonry units* or straw bales such that *head joints* in successive courses are vertically aligned. For the purposes of this code, requirements of stack bond shall apply to *masonry* or straw bales laid in other than a *running bond*.
STRAW. The dry stems of cereal grains after the seed heads have been removed.
STRAW BALE. A rectangular compressed block of straw, bound by ties.
STRAWBALE. The adjective form of straw bale.
STRAW-CLAY. Loose straw mixed and coated with clay slip.
TIE. A synthetic fiber, natural fiber, or metal wire used to confine a straw bale.
TRUTH WINDOW. An area of a strawbale wall left without its finish, to allow view of the straw otherwise concealed by its finish.
WALL, LOAD-BEARING. Any wall meeting ~~either~~ one of the following classifications:

1. Any metal or wood stud wall that supports more than 100 pounds per linear foo (1459 N/m) of vertical load in addition to its own weight.
2. Any masonry or concrete wall that supports more than 200 pound per linear foot (2919 N/m) of vertical load in addition to its own weight.
3. Any strawbale wall that supports more than 100 lb/linear ft (1,459 N/m) of vertical load in addition to its own weight.

WALL, NONSTRUCTURAL. All walls other than load-bearing walls or shear walls.
WALL, STRUCTURAL. A wall that meets the definition for a load-bearing wall or shear wall.

PART II – IBC FIRE SAFETY

SECTION 2407
FIRE RESISTANCE

2407.1 Fire-resistance rating. Fire-resistance ratings for strawbale walls shall be established in accordance with Section 2407.1.1 or 2407.1.2, or shall be determined in accordance with Section 703.2 or 703.3 of the *International Building Code*.

2407.1.1 1-hour rated clay plastered wall. 1-hour fire-resistance-rated nonload-bearing clay plastered strawbale walls shall comply with all of the following:

1. Bales shall be laid flat or on-edge in a running bond. Gaps shall be fire-stopped with straw-clay,
2. Bales shall maintain a thickness of not less than 18 inches (457 mm),
3. Clay plaster on each side of the wall shall be not less than 1 inch (25 mm) thick and shall be comprised of a mixture of 3 parts clay, 2 parts chopped straw, and 6 parts sand, or an alternative *approved* clay plaster.
4. Plaster application shall be in accordance with Section 2406.9 for the number and thickness of coats.

2407.1.2 2-hour rated cement plastered wall. 2-hour fire-resistance-rated nonload-bearing cement plastered strawbale walls shall comply with all of the following:

1. Bales shall be laid flat or on-edge in a running bond. Gaps shall be fire-stopped with straw-clay.
2. Bales shall maintain a minimum thickness of 14 inches (356 mm).
3. 1 1/2 inch (38 mm) by 17 gauge galvanized woven wire mesh shall be attached to wood members with 1 1/2 inch (38 mm) staples at 6 inches (406 mm) on center. 9 gauge U-pins with minimum 8 inch (203 mm) legs shall be installed in the field at 18 inches (457 mm) on center.
4. Cement plaster on each side of the wall shall be not less than 1 inch (25 mm) thick.
5. Plaster application shall be in accordance with Section 2406.14 for the number and thickness of coats.

2407.2 Openings in rated walls. Openings and penetrations in bale walls required to have a fire-resistance rating, shall satisfy the same requirements for openings and penetrations as prescribed in the *International Building Code*.

2407.3 Clearance to fireplaces and chimneys. Strawbale surfaces adjacent to fireplaces or chimneys shall have a minimum 3/8 inch (10 mm) thick plaster coat of any type permitted by this section, and shall maintain the specified clearances to the plaster finish as required to combustibles in *International Building Code* Chapter 21, Sections 2111, 2112, and 2113, or as required by manufacturer's installation instructions, whichever is more restrictive.

2407.4 Type of construction. Buildings or portions thereof utilizing strawbale walls in accordance with this chapter shall be classified as Type V-B construction. Strawbale walls constructed in compliance with Section 2407.1.1 or 2407.1.2 shall be permitted wherever combustible walls of the same fire-resistance are allowed by Chapter 6 of the *International BuildIng Code*. Strawbale walls with any finish allowed by this chapter shall be permitted wherever non-rated combustible walls are allowed by the *International Building Code*.

Reason: Strawbale construction has proven to be a safe, durable, resource efficient, and fully viable method of construction. However, the International Building Code does not contain a section on strawbale construction, which has been an impediment to this construction system's proper and broader use.

First practiced in Nebraska in the late 1800's, with buildings over 100 years old still in service, strawbale construction was rediscovered in the 1980's in the American southwest. Since then it has been further developed and explored, including considerable testing and research regarding structural performance (under vertical and lateral loads), moisture, fire, and its thermal and acoustic properties.

Currently only Oregon and New Mexico have adopted statewide strawbale building codes. California has legislated strawbale construction guidelines that are voluntarily adopted at the local level. In addition, nine U.S. cities or counties have adopted strawbale building codes. Three countries outside the United States – Germany, France, and Belarus - have limited strawbale building codes.

Most of the strawbale building codes that do exist are derived from the first such code, created for and adopted by Tucson / Pima County, Arizona in 1996. Much experience, testing, and research since then have proven these codes to be deficient. They are often either too restrictive, or not restrictive enough, and in some cases don't address important issues at all.

Although strawbale codes are both few and flawed, strawbale buildings are now found in 49 of the 50 United States, and strawbale construction is practiced in over 45 countries throughout the world and in every climate. There are an estimated 600-1000 strawbale buildings in California alone. The strawbale buildings in the U.S. include residences, schools, office buildings, wineries, multi-story buildings, buildings over 10,000 sq.ft in floor area, load-bearing strawbale structures, and structures in areas of high seismic risk (plastered strawbale walls are particularly resistant to earthquakes). The practice of, and the desire to utilize strawbale construction, continues to increase and promises to accelerate as we face increased pressure on our environment and natural resources

There is great need for a comprehensive strawbale code, with full benefit of the experience and knowledge that has been gained to date about this method of construction. The following proposed Strawbale Construction chapter for the IBC was created to fulfill this need. It is based on the collective experience of the design, construction, and testing of strawbale buildings over 20 years by architects, engineers, builders, and academics throughout the U.S., Canada, and other countries throughout the world. The testing, research, and comprehensive understanding of the performance of strawbale buildings are summarized in the book *Design of Straw Bale Buildings* (B.King, et al, 2006, Green Building Press). Testing, research reports, and other supporting documentation are available for viewing and download at: http://www.ecobuildnetwork.org/strawbale-construction-code-supporting-documentation

As lead author of the proposed chapter, and as a licensed architect for 25 years, I have been involved in the design, construction, testing, and research of strawbale buildings since 1995. In 2001 I spearheaded legislation and revisions to the current California Guidelines for Straw-Bale Structures. The proposed Strawbale Construction chapter for the IBC has benefited from numerous peer reviews by experienced, licensed design and building professionals over the course of more than five years. It would serve designers, builders, owners, inhabitants, and building officials alike in the construction and utilization of strawbale buildings.

Supporting Documentation: List of selected documents available via the above link

Load-Bearing Straw Bale Construction – A summary of worldwide testing and experience, B.King, PE
Testing of Straw Bale Walls with Out-of-Plane Loads – K.Donahue, SE
In-Plane Cyclic Tests of Plastered Straw Bale Wall Assemblies – C.Ash, M.Aschheim, PE, D.Mar, SE
Structural Testing of Plastered Straw Bale Wall Assemblies – K.Lerner, Architect, K.Donahue, SE
Seismic Design Factors and Allowable Shears for Strawbale Wall Assemblies – S. Jalali, M. Aschheim, PE
Shake Table Test Video of Full Scale Straw Bale Building Specimen – D.Donovan, PE
Moisture Properties of Plaster and Stucco for Strawbale Buildings – J.Straube, PE
Monitoring of Hygrothermal Performance of Strawbale Walls – J.Sraube, PE, C.Schumacher
ASTM E119 1-Hour Fire Resistance Test of a Non-Loadbearing Straw Bale Wall with Clay Plaster
ASTM E119 2-Hour Fire Resistance Test of a Non-Loadbearing Straw Bale Wall with Cement Plaster
ASTM E119 Fire Tests - Video
Thermal Performance of Straw Bale Wall Systems (incl. Oak Ridge Lab test results) – N.Stone
Support Letters from Licensed Practitioners: Letters from 2 Structural Engineers, 4 Civil Engineers, 1 Professor of Civil Engineering, 7 Architects

Cost Impact: The code change proposal will not increase the cost of construction.

S316-12

PART I – INTERNATIONAL BUILDING CODE - STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE – FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

CH 24 (NEW)-S-HAMMER.doc

S317–12
Chapter 35 (NEW)

Proponent: John Woestman, Kellen Company, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com)

Add new text as follows:

CHAPTER 35
COMPOSITES

SECTION 3501
GENERAL

3501.1 Scope. These provisions shall govern the materials, design, application, construction and installation of composite materials and products.

SECTION 3502
DEFINITIONS

3502.1 General. The following words and terms shall, for the purposes of this chapter have the meanings shown herein.

WOOD PLASTIC COMPOSITE. A composite material made primarily from wood or cellulose-based materials, and plastic.

SECTION 3503
WOOD PLASTIC COMPOSITE EXTERIOR MATERIALS AND PRODUCTS

3503.1 General. The provisions of this section shall govern the requirements and uses of wood plastic composite materials and products for exterior decks, balconies, and porches of buildings and structures.

3503.1.1 Wood plastic composite exterior deck boards, stair treads, handrails, and guardrail systems. Exterior deck boards, stair treads, handrails, and guardrail systems of wood plastic composite shall comply with this section.

3503.1.1.1 Minimum standards and quality. Exterior wood plastic composite deck boards, stair treads, and handrails and guardrail systems shall comply with ASTM D 7032.

3503.1.1.2 Structural. The allowable load and maximum allowable span for exterior wood plastic composite deck boards and stair treads shall be determined in accordance with ASTM D7032. Testing of handrails and guardrail systems to demonstrate compliance to the structural performance requirements of this code shall be in accordance with ASTM D7032.

3503.1.1.3 Labeling. Deck boards and stair treads shall bear a label that indicates compliance to ASTM D7032 and includes the allowable load and maximum allowable span. Handrails and guardrail systems or their packaging shall bear a label that indicates compliance to ASTM D7032 and includes the maximum allowable span.

3503.1.1.4 Installation. Wood plastic composite deck components shall be installed in accordance with the manufacturer's instructions.

Add new standard to Chapter 35 as follows:

ASTM

<u>D 7032-10a</u> <u>Standard Specification for Establishing Performance Ratings For Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)</u>

Reason: Currently, the IBC is silent regarding specific requirements for wood plastic composite decking materials.

Composite materials may not neatly fit into the wood chapter of the IBC (Chapter 23) or in the plastics chapter (Chapter 26). A logical location for this material is in a new chapter titled “Composites.” Looking to the future, this new chapter creates a logical location in the IBC for other composites that may be utilized in building construction but fall outside the scopes of Chapter 23 and Chapter 26. If Chapter 35, at the end of the IBC, is not the best location for this proposed new chapter for composites, ICC staff can editorially move this proposed new chapter to a more appropriate location in the IBC.

This proposal introduces a definition of wood plastic composite (limited to the scope of this chapter) and creates a section for exterior materials and products made from this specific material. Then the proposal limits the scope of the requirements to materials and products for exterior decks, balconies, and porches. Finally, the proposal introduces specific requirements for exterior wood plastic composite deck boards, stair treads, handrails, and guardrail systems.

With this proposal, CLMA seeks to introduce mandatory requirements in the IBC for exterior wood plastic composite deck components while making it easier for builders to comply with the code and for building officials to enforce the code.

Including the labeling requirement in this proposal brings WPCs within the requirements of the definition of “label” in Chapter 2 of the IBC, thus requiring 3rd party certification of these WPCs and ongoing quality assurance. This requirement helps to assure building officials that wood plastic composite decking and guards will meet the performance requirements of the IBC.

As with most engineered building components, wood plastic composite deck components should be required to be installed per the manufacturer’s instructions. The manufacturer’s instructions and this proposed language limits the use of these wood plastics to only those uses they were designed for.

This proposal requires wood plastic composite deck boards, stair treads, handrails and guardrail systems to meet the requirements of ASTM D7032, a standard developed specifically for demonstrating code compliance of WPC exterior deck components. Meeting the requirements of ASTM D7032 verifies the engineered WPC products are appropriate for use as exterior deck components. ASTM D7032 includes deck-related performance evaluations and performance requirements such as flexural tests, bio-degradation tests, fire performance tests, creep recovery tests, mechanical fastener holding tests, and slip resistance tests. The standard also includes consideration of the effects of temperature, moisture, concentrated loads, freeze-thaw resistance tests, UV resistance, and duration of load on WPC deck boards, stair treads, and handrail and guardrail systems.

The design capacity of each WPC deck board, stair tread, handrail, and guardrail system is tested and evaluated according to product specification ASTM D7032. The testing required in D7032 addresses IBC requirements for deck boards, stair treads, handrails, and guardrail systems.

The result of these tests determines an allowable load and span rating for deck boards and a stringer spacing for stair treads. Product labels will show verification of compliance with ASTM D 7032 and provide the appropriate performance information. For example, deck board labels would identify the allowable load and span (e.g., 100 psf load on a 16” span would be expressed as “16/100”). For stair treads, ASTM D7032 requires load and span testing at higher loads (300 psf and 750 lb concentrated load). This concentrated load test for WPC stair treads is 2.5 times what’s required in the IBC in Table 1607.1, Footnote f.

Guardrail systems, per ASTM D7032, are required to be subjected to and pass the in-fill load test, the uniform load test, and the concentrated load test at 2.5 times the loads required by the IBC (in Section 1607.8) with the guardrail system constructed according to the manufacturer’s instructions. These tests evaluate the strength and stiffness of all components and their connections.

For designers, specifiers, builders, and for code enforcement, the maximum post spacing (span) for guardrail systems is required to be on the label, as is verifying compliance to ASTM D7032. And, of course, guardrail systems for projects constructed under the IBC must meet the requirements of Section 1012 and 1013.

Assuming WPC deck boards, stair treads, and guardrail systems are selected, specified, and installed according to the manufacturer’s instructions – and the manufacturer confirms compliance to ASTM D7032 in their literature and on the product label – designing exterior deck projects which use WPC components is quite straightforward: 1) Select WPC deck boards that meet or exceed the required load (per IBC Table 1607.1) at the desired span of the deck’s joists. 2) Plan for stair stringers no farther apart than the maximum allowable span for the desired WPC stair treads. 3) Select a WPC guardrail system that meets the minimum height requirements for the project (i.e. 42” for the IBC) and plan for guardrail supports (posts) no further apart than the maximum spacing (span) allowed by the guardrail system’s manufacturer.

Cost Impact: Zero to a cost reduction because of easier code compliance with specific requirements included in the IBC.

S317-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

CH 35 (NEW)-S-WOESTMAN.doc

S318–12
G1001.4

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Revise as follows:

G1001.4 Enclosures below design flood elevation. Fully enclosed areas below the design flood elevation shall be ~~at or above grade on all sides and conform to the following:~~ constructed in accordance with ASCE 24.

1. ~~In *flood hazard areas* not subject to high-velocity wave action, enclosed areas shall have flood openings to allow for the automatic inflow and outflow of floodwaters.~~
2. ~~In *flood hazard areas* subject to high-velocity wave action, enclosed areas shall have walls below the design flood elevation that are designed to break away or collapse from a water load less than that which would occur during the design flood, without causing collapse, displacement or other structural damage to the building or structure~~.

Reason: ASCE 24 includes requirements for enclosures below elevated buildings that vary based on flood zone. Referencing ASCE 24 eliminates the need to make coordinating changes if ASCE 24 changes in the future.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. Utility and miscellaneous group U buildings with enclosures should already be required to meet the requirements for enclosures.

S318-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G1001.4-S-INGARGIOLA-WILSON-QUINN.doc

S319–12
G102.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

G102.1 General. This appendix, in conjunction with the *International Building Code*, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; site improvements and installation of utilities; placement and replacement of manufactured homes; placement of recreational vehicles; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage, installation of tanks; temporary structures, and temporary or permanent storage, utility and miscellaneous Group U buildings and structures, and certain building work exempt from permit under Section 105.2 and other buildings and development activities.

Reason: The purpose of this section is to identify the development activities for which minimum requirements are listed in Appendix G. The proposed changes are consistent with the subsections in Appendix G (including some proposed new subsections).

Cost Impact: The code change proposal will not increase the cost of construction.

S319-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G102.1-S-INGARGIOLA-WILSON-QUINN.doc

S320–12
G103.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

G103.1 Permit applications. All applications for permits must comply with the following

1. The *building official* shall review all *permit* applications to determine whether proposed development ~~sites will be reasonably safe from flooding~~ are located in flood hazard areas established in Section G102.2.
2. If a proposed development site is in a flood hazard area, ~~all site development activities (including grading, filling, utility installation and drainage modification), all new construction and substantial improvements (including the placement of prefabricated buildings and manufactured homes) and certain building work exempt from *permit* under Section 105.2~~ all development to which this appendix is applicable as specified in Section G102.1 shall be designed and constructed with methods, practices and materials that minimize flood damage and that are in accordance with this code and ASCE 24.

Reason: This proposal clarifies that the first step is to determine whether proposed development activities are locate in (or out) of the mapped flood hazard area. The second item is simplified; rather than restate the long list of development activities, it is clearer to refer to the list that is already present in G102.1.

Cost Impact: The code change proposal will not increase the cost of construction.

S320-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G103.1-S-INGARGIOLA-WILSON-QUINN.doc

S321–12
G103.4, G103.5, G103.6.1, G401.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Revise as follows:

G103.4 Activities in riverine flood hazard areas. In riverine *flood hazard areas* where *design flood elevations* are specified but *floodways* have not been designated, the *building official* shall not permit any new construction, substantial improvement or other development, including fill, unless the applicant submits an engineering analysis prepared and sealed by a registered design professional, that demonstrates that the cumulative effect of the proposed development, when combined with all other existing and anticipated flood hazard area encroachment, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the community.

G103.5 Floodway encroachment. Prior to issuing a *permit* for any *floodway* encroachment, including fill, new construction, substantial improvements and other development or land-disturbing activity, the *building official* shall require submission of a certification, sealed by a registered design professional, along with supporting technical data, that demonstrates that such development will not cause any increase of the level of the base *flood*.

G103.6.1 Engineering analysis. The *building official* shall require submission of an engineering analysis, prepared and sealed by a registered professional, which demonstrates that the flood-carrying capacity of the altered or relocated portion of the watercourse will not be decreased. Such watercourses shall be maintained in a manner which preserves the channel's flood-carrying capacity.

G103.7 Alterations in coastal areas. Prior to issuing a permit for any alteration of sand dunes and mangrove stands in flood hazard areas subject to high velocity wave action, the *building official* shall require submission of an engineering analysis, prepared and sealed by a registered design professional, which demonstrates that the proposed alteration will not increase the potential for flood damage.

G401.1 Development in floodways. Development or land disturbing activity shall not be authorized in the *floodway* unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice, and prepared and sealed by a registered design professional, that the proposed encroachment will not result in any increase in the level of the base *flood*.

Reason: The analyses referred to in these sections are prepared by engineers. The building official is not expected to have the experience or qualifications to determine whether such analyses were properly prepared. Specifying that the work has to be prepared and sealed by an RDP puts the burden on the RDP to meet standards of practice for these analyses. This requirement is consistent with the NFIP and the same requirement should already appear in local floodplain management regulations.

Cost Impact: The code change proposal will not increase the cost of construction. This requirement is consistent with the NFIP and the same requirement should already appear in local floodplain management regulations.

S321-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G103.4-S-INGARGIOLA-WILSON-QUINN.doc

S322–12
G103.8 (NEW)

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Add new text as follows:

G103.8 Inspections. Development for which a permit under this appendix is required shall be subject to inspection. The building official or the building official's designee shall make or cause to be made, inspections of all development in flood hazard areas authorized by issuance of a permit under this appendix.

Reason: Just as the code requires inspection of permitted buildings, this appendix should require inspection of all other development in flood hazard areas for which permits are issued.

Cost Impact: The code change proposal will not increase the cost of construction. Inspection of non-building development that is permitted in flood hazard areas should already be performed by communities that participate in the NFIP.

S322-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G103.8 #1-S-INGARGIOLA-WILSON-QUINN.doc

S323–12
G103.8 (NEW), G104.2

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

<u>**G103.8 Substantial improvement and substantial damage determinations.** For permit applications to improve or repair buildings and structures, including additions, repairs, rehabilitations, renovations, alterations, relocations, reconstructions, or other work, the building official, shall:</u>

1. <u>Estimate the market value, or require the applicant to obtain a professional appraisal of the market value, of the building or structure before the proposed work is performed; the market value of the building or structure shall be the market value before the damage occurred or before any improvement is made;</u>
2. <u>Compare the cost to perform the improvement, the cost to repair the damaged building to its pre-damaged condition, or the combined costs of improvements and repairs, if applicable, to the market value of the building or structure;</u>
3. <u>Determine and document whether the proposed work constitutes substantial improvement or repair of substantial damage; and</u>
4. <u>If the determination finds that the proposed work constitutes substantial improvement or repair of substantial damage, notify the applicant of the results of the determination and whether compliance with the requirements of the building code is required.</u>

~~G103.8~~ <u>G103.9</u> Records. The *building official* shall maintain a permanent record of all *permits* issued in *flood hazard areas*, including copies of inspection reports and certifications required in Section 1612.

G104.2 Application for permit. The applicant shall file an application in writing on a form furnished by the *building official*. Such application shall:

1. Identify and describe the development to be covered by the permit.
2. Describe the land on which the proposed development is to be conducted by legal description, street address or similar description that will readily identify and definitely locate the site.
3. Include a site plan showing the delineation of flood hazard areas, floodway boundaries, flood zones, design flood elevations, ground elevations, proposed fill and excavation and drainage patterns and facilities.
4. Indicate the use and occupancy for which the proposed development is intended.
5. Be accompanied by construction documents, grading and filling plans and other information deemed appropriate by the building official.
6. State the valuation of the proposed work.
7. <u>Include a market value appraisal of the building (excluding land), for applications for work on existing buildings, unless otherwise advised by the building official.</u>

~~7~~<u>8.</u> Be signed by the applicant or the applicant's authorized agent.

Reason: Communities that participate in the NFIP agree to regulate all development in flood hazard areas. FEMA states that the flood provisions in the I-Codes are consistent with the NFIP requirements for the design and construction of buildings. To fully meet the requirements of the NFIP local jurisdictions must adopt a local ordinance or Appendix G in order to have the necessary administrative provisions and requirements for development other than buildings.

Section 105.3 of the code requires the applicant to describe the work to be covered by the permit and to state the valuation of the proposed work. The building code defines and uses the terms “substantial improvement” and “substantial damage.” This proposal clarifies how the building official is to use the information to determine whether proposed work meets the definitions.

FEMA recently published FEMA P-758, *Substantial Improvement/Substantial Damage Desk Reference*, that includes guidance for local officials on estimating market value as well as estimating costs. This proposal states that the applicant shall submit a market value appraisal unless otherwise advised; FEMA guidance now states that local officials may use “adjusted assessed value” or “actual cash value” (replacement minus depreciation).

Cost Impact: The code change proposal will not increase the cost of construction. Determining whether work proposed on an existing building is substantial improvement or repair of substantial damage is implicit in the definitions of those terms. This proposal does not change the fact that determining whether proposed work meets those definitions has to be done. It simply clarifies how it is to be done.

S323-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G103.8 #2-S-INGARGIOLA-WILSON-QUINN.doc

S324–12
G104.2

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

G104.2 Application for permit. The applicant shall file an application in writing on a form furnished by the *building official*. Such application shall:

1. Identify and describe the development to be covered by the permit.
2. Describe the land on which the proposed development is to be conducted by legal description, street address or similar description that will readily identify and definitely locate the site.
3. Include a site plan showing the delineation of flood hazard areas, floodway boundaries, flood zones, design flood elevations, ground elevations, proposed fill and excavation and drainage patterns and facilities.
4. Include in subdivision proposals and other proposed developments with more than 50 lots or larger than 5 acres, base flood elevation data in accordance with to Section 1612.3.1 if such data are not identified for the flood hazard areas established in Section G102.2.

~~4~~5. Indicate the use and occupancy for which the proposed development is intended.
~~5~~6. Be accompanied by construction documents, grading and filling plans and other information deemed appropriate by the building official.
~~6~~7. State the valuation of the proposed work.
~~7~~8. Be signed by the applicant or the applicant's authorized agent.

Reason: Appendix G includes requirements for subdivisions which is consistent with the NFIP requirement un federal regulation (44 CFR 60.3(b)(3)). If proposals for larger developments and subdivisions are affected by flood hazard areas shown on FIRMs, but the areas do not have base flood elevations, the requirement is that elevations have to be developed. Section 1612.3.1 allows use of data available from other sources, or authorizes the building official to require such information be developed by the applicant.

Cost Impact: The code change proposal will not increase the cost of construction. This should already be required by communities that participate in the NFIP

S324-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G104.2-S-INGARGIOLA-WILSON-QUINN.doc

S325–12
G501 (NEW)

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Add new text as follows:

G501.4 Protection of mechanical equipment and outside appliances. Mechanical equipment and outside appliances shall be elevated to or above the design flood elevation.

> **Exception.** Where such equipment and appliances are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to the elevation required by Section 1612, the systems and equipment shall be permitted to be located below the elevation required by Section 1612. Electrical wiring systems shall be permitted below the design flood elevation provided they conform to the provisions of NFPA 70.

Reason: This language comes from G1001.6. Adding this does not create a new requirement because the NFIP requires that the same code requirements for equipment and appliances associated with buildings in flood hazard areas also apply to equipment and appliances associated with manufactured homes.. FEMA guidance is found in *Protecting Manufactured Homes from Floods and Other Hazards* (FEMA P-85, issued November 2009).

Cost Impact: The code change proposal will not increase the cost of construction. Elevation or protection of equipment and appliances is already a requirement for communities that participate in the NFIP

S325-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G501 (NEW)-S-INGARGIOLA-WILSON-QUINN.doc

S326–12
G501.4 (NEW)

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Add new text as follows:

G501.4 Enclosures. Fully enclosed areas below elevated manufactured homes shall comply with the requirements of Section 1612.

Reason: Adding this does not create a new requirement because the NFIP and local floodplain management ordinances require that the same requirements for enclosed areas below elevated buildings also apply to enclosures under elevated manufactured homes (Section 1612 refers to ASCE 24 for specific requirements, which vary based on flood zone). FEMA guidance is found in *Protecting Manufactured Homes from Floods and Other Hazards* (FEMA P-85, issued November 2009).

Cost Impact: The code change proposal will not increase the cost of construction. Already a requirement for communities that participate in the NFIP.

S326-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G501-S-INGARGIOLA-WILSON-QUINN.doc

S327–12
G701.1 (NEW)

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Delete and substitute as follows:

~~**G701.1 Underground tanks.** Underground tanks in *flood hazard areas* shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design *flood*.~~

~~**G701.2 Above-ground tanks.** Above-ground tanks in flood hazard areas shall be elevated to or above the design *flood* elevation or shall be anchored or otherwise designed and constructed to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design *flood*.~~

~~**G701.3 Tank inlets and vents.** In *flood hazard areas*, tank inlets, fill openings, outlets and vents shall be:~~

1. ~~At or above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the design *flood*.~~
2. ~~Anchored to prevent lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design *flood*.~~

<u>**G701.1 Tanks.** Underground and above-ground tanks shall be designed, constructed, installed and anchored in accordance with ASCE 24.</u>

Reason: ASCE 24 contains both performance requirements for tanks and the limitations based on flood zone. This proposal references ASCE 24, rather than replicate those requirements in Appendix G, thus eliminating the need to make coordinating changes if ASCE 24 changes in the future.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. Tanks in flood hazard areas are already regulated.

S327-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G701-1-S-INGARGIOLA-WILSON-QUINN.doc

S328–12
G801.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

G801.1 ~~Detached~~ Garages and accessory structures. ~~Detached accessory structures shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of bouyancy, during conditions of the design *flood*. Fully enclosed accessory structures shall have flood openings to allow for the automatic entry and exit of *flood* waters~~. Garages and accessory structures shall be designed and constructed in accordance with ASCE 24.

Reason: ASCE 24 contains requirements garages and accessory structures that allow them to be constructed without meeting the elevation requirements, provided certain other requirements are met. Those requirements are, in part, based on flood zone. This proposal references ASCE 24, rather than replicate those requirements in Appendix G, thus eliminating the need to make coordinating changes if ASCE 24 changes in the future.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. Garaged and accessory structures in flood hazard areas are development and thus are already regulated.

S328-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G801.1-S-INGARGIOLA-WILSON-QUINN.doc

S329–12
G801.5

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

G801.5 Swimming pools. ~~Prefabricated swimming pools~~ Swimming pools shall be designed and constructed in accordance with ASCE 24. Above-ground swimming pools, on-ground swimming pools, and in-ground swimming pools that involve placement of fill in *floodways* shall also meet the requirements of Section G103.5.

Reason: ASCE 24-05 includes requirements for pools which vary by flood zone. The next edition of ASCE 24 will more distinctly clarify requirements for pools in different flood zones. Referencing ASCE 24 eliminates the need to make coordinating changes in the future.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. Pools in flood hazard areas are development and thus are already regulated.

S329-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G801.5-S-INGARGIOLA-WILSON-QUINN.doc

S330–12
G801.6 (NEW)

Proponent:

Revise as follows: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Add new text as follow:

G801.6 Decks, porches, and patios. Decks, porches and patios shall be designed and constructed in accordance with ASCE 24.

Reason: ASCE 24 includes requirements for decks, porches, and patios which vary by flood zone. Referencing ASCE 24 eliminates the need to make coordinating changes if ASCE 24 changes in the future.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. Decks, porches, and patios in flood hazard areas are development and thus are already regulated.

S330-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G801.6#1-S-INGARGIOLA-WILSON-QUINN.doc

S331–12
G801.6 (NEW)

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Add new text as follows:

G801.6 Non-structural concrete slabs in coastal high hazard areas and coastal A zones. In coastal high hazard areas and coastal A zones, non-structural concrete slabs used as parking pads, enclosure floors, landings, decks, walkways, patios and similar nonstructural uses are permitted beneath or adjacent to buildings and structures provided the concrete slabs shall be constructed in accordance with ASCE 24

Reason: ASCE 24 includes requirements for nonstructural slabs, which vary by flood zone. Referencing ASCE 24 eliminates the need to make coordinating changes if ASCE 24 changes in the future.

ASCE began the process of updating ASCE 24-05 in early 2011 and the next edition is expected to be published late 2012 or early 2013. The ASCE committee expects to have the near-final draft prepared and available at least a month before the Group A hearings and copies will be provided to the ICC committee.

Cost Impact: The code change proposal will not increase the cost of construction. Non-structural concrete slabs in flood hazard areas are development and thus are already regulated.

S331-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G801.6#2-S-INGARGIOLA-WILSON-QUINN.doc

S332–12
G801.6 (NEW)

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Add new text as follows:

G801.6 Roads and watercourse crossings in regulated floodways. Roads and watercourse crossings that encroach into regulated floodways, including roads, bridges, culverts, low-water crossings and similar means for vehicles or pedestrians to travel from one side of a watercourse to the other side, shall meet the requirement of Section G103.5.

Reason: The NFIP requires communities to regulate all development. The concern with roads and other crossings is whether they encroach into floodways. Floodway encroachments may cause increases in flood elevations which can increase flooding on other properties and increase the extend of mapped special flood hazard areas.

Cost Impact: The code change proposal will not increase the cost of construction. Waterway crossings are development and thus are already regulated.

S332-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G801.6-S-INGARGIOLA-WILSON-QUINN.doc

S333–12
G901.1

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

G901.1 Temporary structures. Temporary structures shall be erected for a period of less than 180 days. Temporary structures shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design *flood*. Fully enclosed temporary structures shall have flood openings <u>that are in accordance with ASCE 24</u> to allow for the automatic entry and exit of floodwaters.

Reason: Without the reference to ASCE 24, neither the applicant nor the building official has enough specificity to determine whether flood openings are compliant.

Cost Impact: The code change proposal will not increase the cost of construction. Consistent with FEMA guidance for temporary structures that are walled and roofed.

S333-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

G901.1-S-INGARGIOLA-WILSON-QUINN.doc

S334–12
J101.2

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net)

Revise as follows:

J101.2 Flood hazard areas~~.~~ ~~The provisions of this chapter shall not apply to~~ Unless the applicant has submitted an engineering analysis, prepared in accordance with standard engineering practice, and sealed by a registered design professional, that demonstrates the proposed work will not result in any increase in the level of the base flood, grading, excavation and earthwork construction, including fills and embankments, shall not be permitted in *floodways* within *flood hazard areas* established in Section 1612.3 or in *flood hazard areas* where design *flood* elevations are specified but floodways have not been designated~~, unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed work will not result in any increase in the level of the base flood~~.

Reason: This proposal is editorial only. It is intended to make the provision clearer. The only new text is that the engineering analysis is to be prepared and sealed by a registered design professional, which takes the burden off the building official.

Cost Impact: The code change proposal will not increase the cost of construction.

S334-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

J101.2-S-INGARGIOLA-WILSON-QUINN.doc

S335–12
L101.1

Proponent: James Bela, Oregon Earthquake Awareness, representing self

Revise as follows:

L101.1 General. Every ~~structure~~ building located ~~where the 1-second spectral response acceleration, S1, in accordance with Section 1613.3 is greater than 0.40~~ within 15 miles distance of an active fault with a maximum potential earthquake M 6 or above, or lies within 25 miles distance of an active fault wit a maximum potential earthquake M 7 or avove; that either 1) exceeds six stories in height with an aggregate floor area of 60,000 square feet (5574 m2) or more, or 2) exceeds ten stories in height regardless of floor area, shall be equipped with not less than three approved recording accelerographs. The accelerographs shall be interconnected for common start and common timing.

Reason: The 1-second spectral response acceleration contours are interesting, but their locations are yo-yoing around with each new addition of the maps; such that they are not reliable over time. See discussion per Code Change: **IBC-12.13 FIGURE 1613.3.3.1 (1)(2)(3)(4)(5)(6)_.**

An earthquake will occur on a fault, and it is the proximity of a building to an earthquake source that determines its actual experience to ground shaking in a real earthquake. This additional charging language fills this hole in locations, particularly in the western U.S. where there are active faults; but the sum total (of probabilities of exceedence) of all contributing faults is not enough to give 1-second contours of 0.40g.

The term building is as used in the city of Los Angeles strong motion accelerograph language. We have building officials, building codes, building permits, building maintenance, Building Owners and Managers Associations . . . so everyone is pretty clear what a "building" actually is. Maybe, for example, an airplane hangar is more of a structure, than it is a building?

Cost Impact: The code change proposal will not increase the cost of construction.

S335-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

L101.1-S-BELA.doc

S336–12
M101

Proponent: Michael Mahoney, Federal Emergency Management Agency, representing National Tsunami Hazard Mitigation Program

Revise as follows:

APPENDIX M
TSUNAMI-GENERATED FLOOD HAZARD
The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance

~~SECTION M101~~
~~TSUNAMI-GENERATED FLOOD HAZARD~~

SECTION M101
GENERAL

M101.1 ~~General~~ Scope. The purpose of this appendix is to provide tsunami regulatory criteria for those communities that have a tsunami hazard and have elected to develop and adopt a map of their tsunami hazard ~~inundation~~ zone. This appendix applies to structures located within an identified Tsunami Hazard Zone, as defined by the Authority Having Jurisdiction.

M101.2 Performance objectives. All structures that are considered either essential to the community and its disaster response or structures that represent a substantial hazard to human life in the event of failure, as defined by Risk Category III and IV as specified under Section 1604.5 of the *International Building Code*, must be protected from tsunamis by either being located outside of the Tsunami Hazard Zone or be designed and constructed to withstand without collapse the specified loads and effects associated with the Maximum Considered Tsunami. For structures in other Risk Categories, life safety protection is to be provided by a community Tsunami Warning and Evacuation Procedure.

M101.3 Tsunami Design Hazard Level. The regulatory criteria contained in this appendix is based on the Maximum Considered Tsunami and its associated flow elevation and velocity, which shall be determined by the Authority Having Jurisdiction. The Maximum Considered Tsunami shall be permitted to be derived either deterministically or probabilistically by the Authority Having Jurisdiction. The Maximum Considered Tsunami shall be represented using a Tsunami Hazard Zone Map adopted by the Authority Having Jurisdiction.

~~M101.2~~ M101.4 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein.

MAXIMUM CONSIDERED TSUNAMI. A tsunami that is determined and adopted by the Authority Having Jurisdiction for design purposes and represented using a Tsunami Hazard Zone Map. The Maximum Considered Tsunami shall be taken as having a collapse prevention design equivalent of a 2% probability of being exceeded in a 50-year period or a 2500 year average return period.

TSUNAMI HAZARD ZONE MAP. A map adopted by the ~~community~~ authority having jurisdiction that designates the extent of inundation ~~by a design event~~ the maximum considered tsunami. This map shall ~~be based on the~~ take into consideration any available tsunami inundation map which is developed and provided to a community by either the applicable State agency or the National Oceanic and Atmospheric ~~and Oceanic~~ Administration (NOAA) under the National Tsunami Hazard Mitigation program, but shall be permitted to utilize a different probability or hazard level.

TSUNAMI HAZARD ZONE. The area vulnerable to being flooded or inundated ~~by a design event~~ the maximum considered tsunami as identified on a community's Tsunami Hazard Zone Map.

TSUNAMI VERTICAL EVACUATION REFUGE. A Tsunami Vertical Evacuation Refuge is a structure designated to serve as a point of refuge to which a community's population can evacuate above a tsunami when high ground is not available. It is designed and constructed so as to comply with the applicable provisions of the latest edition of *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis*, published by the Federal Emergency Management Agency (FEMA P-646).

TSUNAMI WARNING AND EVACUATION PROCEDURE. A Tsunami Warning and Evacuation Procedure is a plan and procedure developed and adopted by a community that would receive a tsunami warning from the National Oceanic and Atmospheric Administration (NOAA) at all hours and transmit that warning to its citizens and establishes and designates evacuation routes for its citizens to either high ground or to a designated Tsunami Vertical Evacuation Refuge. Tsunami evacuation procedures may use evacuation maps that are significantly greater in extent than the tsunami hazard zone and are not developed for design purposes. Tsunami evacuation maps are based on the tsunami inundation map which is developed and provided to a community by either the applicable State agency or NOAA under the National Tsunami Hazard Mitigation Program.

SECTION M102
TSUNAMI REGULATORY CRITERIA

~~M101.3~~ M102.1 Establishment of Tsunami Hazard Zone. Where applicable, if a community has adopted a Tsunami Hazard Zone Map, that map shall be used to establish a community's Tsunami Hazard Zone.

~~M101.4~~ M102.2 Construction within the Tsunami Hazard Zone. Construction of structures designated Risk Category III and IV as specified under Section 1604.5 shall be prohibited within a Tsunami Hazard Zone.

Exception~~s~~:

~~1. A vertical evacuation tsunami refuge shall be permitted to be located in a Tsunami Hazard Zone provided it is constructed in accordance with FEMA P646.~~

~~2.~~ Community Risk Category III and IV structures and other critical facilities shall be permitted to be located within the Tsunami Hazard Zone when such a location is necessary to fulfill their function, providing ~~suitable structural and emergency evacuation~~ the following measures have been incorporated.

1. The structure and its foundation shall be designed to resist without collapse all tsunami loads associated with the Maximum Considered Tsunami, including hydrostatic, hydrodynamic, waterborne debris accumulation and impact loads, and scour.
2. A Tsunami Warning and Evacuation Procedure has been incorporated for the facilities.

M102.3 Tsunami Vertical Evacuation Refuge. A structure designated as a Tsunami Vertical Evacuation Refuge shall be permitted to be located in a Tsunami Hazard Zone provided it meets the following criteria:

1. The structure shall be designated as a Tsunami Vertical Evacuation Refuge Structure and shall be capable of being operational within the community's tsunami warning time.
2. The structure shall be designed and constructed so as to comply with the applicable provisions of the latest edition of *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis*, published by the Federal Emergency Management Agency (FEMA P-646).
3. All operational components of the refuge structure necessary for life safety shall be located above the elevation of the Maximum Considered Tsunami. .

The structure and its foundation shall be designed and constructed to resist seismic loads as defined in Chapter 16 of the *International Building Code* for Risk Category IV structures.

M102.4 Tsunami Warning and Evacuation Procedure. The jurisdiction shall have a Tsunami Warning and Evacuation Procedure adopted and enforced by a community that shall be capable of receiving a tsunami warning from the National Oceanic and Atmospheric Administration (NOAA) at all hours and transmit that warning to its citizens and shall establish and designate evacuation routes for its citizens to either high ground or to a designated Tsunami Vertical Evacuation Refuge.

SECTION ~~M102~~ M103
REFERENCED STANDARDS

FEMA P646—08 Guidelines for Design of Structures for Vertical Evacuation from Tsunamis

Reason: On March 11, 2011, a magnitude 9.0 earthquake struck off the coast of Japan. Although Japan is the most advanced country in the world when it comes to tsunami protection measures, 20,000 people perished from the resulting tsunami. While the damage was utterly devastating with over 250,000 structures collapsed, there were many examples of engineered buildings of multi-story construction that survived the earthquake and subsequent tsunami as well as many partially inundated vertical evacuation refuge buildings that successfully saved many lives.

This same type of subduction fault lies off the coastline of Washington, Oregon and northern California, and Alaska and is capable of unleashing a similar magnitude earthquake and resulting tsunami. Furthermore, tsunamis can and have struck the entire Pacific coast, Hawaii, the Caribbean, portions of the Atlantic coast and even within the Gulf of Mexico. While the probability of a damaging tsunami may be low, the consequences would be enormous.

Prior to the 2011 Japan tsunami, the American Society of Civil Engineers/Structural Engineering Institute Standard ASCE/SEI 7 *Minimum Design Loads for Buildings and Other Structures* had formed a new committee to develop a new chapter on tsunami design. While the committee's work is ongoing, we should update Appendix M with some of their work to date relating to the tsunami load criteria and associated design provisions for essential facilities, such as defining a Maximum Considered Tsunami.

The first Appendix M, adopted and published in the 2012 IBC, focused on keeping critical and high risk structures out of the tsunami inundation zone. This revision keeps that same philosophy but expands the description of what is a properly constructed Tsunami Vertical Evacuation Refuge that can withstand without collapse the hydrostatic, hydrodynamic, debris accumulation and impact loads, and scour associated with the Maximum Considered Tsunami.

The National Tsunami Hazard Mitigation Program is proposing this change to keep Appendix M as current as possible with the latest appropriate information to come out of the ongoing ASCE/SEI 7 Tsunami Loads and Effects Committee's development work. This change proposal has been reviewed by the committee.

Cost Impact: Since the primary difference between this proposed change and the current Appendix M is that it would allow for construction within the Tsunami Inundation Zone providing it meets certain criteria, cost impact is not applicable.

S336-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

M101 (NEW)-S-MAHONEY.doc

S337–12
M101

Proponent: James Bela, Oregon Earthquake Awareness, representing self

Delete without substitution:

~~**SECTION M101 TSUNAMI-GENERATED FLOOD HAZARD**~~

~~**M101.1 General.** The purpose of this appendix is to provide tsunami regulatory criteria for those communities that have a tsunami hazard and have elected to develop and adopt a map of their tsunami hazard inundation zone.~~

~~**M101.2 Definitions.** The following words and terms shall, for the purposes of this appendix, have the meanings shown herein.~~

~~**TSUNAMI HAZARD ZONE MAP.** A map adopted by the community that designates the extent of inundation by a design event tsunami. This map shall be based on the tsunami inundation map which is developed and provided to a community by either the applicable State agency or the National Atmospheric and Oceanic Administration (NOAA) under the National Tsunami Hazard Mitigation program, but shall be permitted to utilize a different probability or hazard level.~~

~~**TSUNAMI HAZARD ZONE.** The area vulnerable to being flooded or inundated by a design event tsunami as identified on a community's Tsunami Hazard Zone Map.~~

~~**M101.3 Establishment of Tsunami Hazard Zone.** Where applicable, if a community has adopted a Tsunami Hazard Zone Map, that map shall be used to establish a community's Tsunami Hazard Zone.~~

~~**M101.4 Construction within the Tsunami Hazard Zone.** Construction of structures designated Risk Category III and IV as specified under Section 1604.5 shall be prohibited within a Tsunami Hazard Zone.~~

~~**Exceptions:**~~

1. ~~A vertical evacuation tsunami refuge shall be permitted to be located in a Tsunami Hazard Zone provided it is constructed in accordance with FEMA P646.~~
2. ~~Community critical facilities shall be permitted to be located within the Tsunami Hazard Zone when such a location is necessary to fulfill their function, providing suitable structural and emergency evacuation measures have been incorporated.~~

~~**SECTION M102 REFERENCED STANDARDS**~~

~~FEMA P646—08 Guidelines for Design of M101.4 Structures for Vertical Evacuation from Tsunamis~~

Reason: Given the recent M 9.1 Great 11 March 2011 Tohoku Earthquake and Tsunami disaster in Japan, I would view this code section to be extremely dangerous to public safety; and I believe that it should be removed. Vertical evacuation structures were overtopped in the Tohoku earthquake, and people were killed as a result. Even concrete structures (previously assumed to be "invincible" were overturned and destroyed.

This "weak" and very problematical FEMA effort has copied the same "failed approach" for U.S. Building design practice – it presupposes a "design tsunami event" – and somehow probabilistically determined. No one is accountable for its failures and tragic loss-of-life that could result if such a standard were "followed." They are too uncertain for "local tsunami" generated waves and coastal innundation.

There needs to be a more "stringent" for accepting something into the building code as a "standard". The fact that it is located in the appendix speaks for itself.

For further background information:
Union Frontiers of Geophysics Lecture: Tohoku to Tsunami: Personal Account From Science to Experience by Hiroo Kanamori
http://sites.agu.org/fallmeeting/scientific-program/lectures/

Insights from the great 2011 Japan earthquake:
The diverse set of waves generated in Earth's interior, oceans, and atmosphere during the devastating Tohoku-oki earthquake reveal some extraordinary geophysics -- Thorne Lay and Hiroo Kanamori
http://www.physicstoday.org/resource/1/phtoad/v64/i12/p33_s1?bypassSSO=1

S23C Gutenberg Lecture*
Great Earthquake Ruptures in the Age of Seismo-Geodesy
Presented by Thorne Lay, University of California, Santa Cruz, USA
http://sites.agu.org/fallmeeting/scientific-program/lectures/bowie-and-named-lectures/6dec/

U33C The Great 11 March 2011 Tohoku Earthquake I
Moscone South, Room 104, 1340h
http://sites.agu.org/fallmeeting/scientific-program/sessions-on-demand-7-december/

U34A The Great 11 March 2011 Tohoku Earthquake II
Moscone South, Room 104, 1600h
http://sites.agu.org/fallmeeting/scientific-program/sessions-on-demand-7-december/

U41D The Great 11 March 2011 Tohoku Earthquake III
Moscone South, Room 104, 0800h
http://sites.agu.org/fallmeeting/scientific-program/sessions-on-demand-8-december/

U42A The Great 11 March 2011 Tohoku Earthquake IV
Moscone South, Room 104, 1020h
http://sites.agu.org/fallmeeting/scientific-program/sessions-on-demand-8-december/

U23C Predicting Extreme Events in Natural and Socioeconomic Systems:
State-of-the-Art and Emerging Possibilities II
Moscone South, Room 103, 1340h
http://sites.agu.org/fallmeeting/scientific-program/sessions-on-demand-6-december/

Cost Impact: The code change proposal will not increase the cost of construction.

S337-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

M101-S-BELA.doc

S338–12
Appendix L (NEW)

Proponent: Stephen V. Skalko, P.E., Portland Cement Association; Eric T. Stafford, representing Institute for Business and Home Safety

Add new text as follows:

APPENDIX L
BUILDING RESILIENCE

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION L101
GENERAL

L101.1 Purpose. The purpose of this Appendix is to promote enhanced public health, safety and general welfare and to reduce public and private property losses due to hazards and natural disasters associated with fires, flooding, high winds and earthquakes.

SECTION L102
STRUCTURAL

L102.1 Ground snowloads. The ground snowloads to be used in determining the design snow loads for roofs shall be equal to 1.2 times the ground snowloads determined in accordance with ASCE 7 or Figure 1608.2 for the contiguous United States and Table 1608.2 for Alaska in the *International Building Code*. Site-specific case studies shall be made in areas designated “CS” in Figure 1608.2. Ground snow loads for sites at elevations above the limits indicated in Figure 1608.2 and for all sites within the CS areas shall be *approved*. Ground snow load determination for such sites shall be based on an extreme value statistical analysis of data available in the vicinity of the site using a value with a 2-percent annual probability of being exceeded (50-year mean recurrence interval). Snow loads are zero for Hawaii, except in mountainous regions as *approved* by the *building official*.

L102.2 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the ultimate design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. The design wind pressure, *p*, and design wind force, *F*, determined in accordance with ASCE 7 or 1609.6 shall be based on a design wind speed equal to the basic wind speed (or locally adopted basic wind speed in special wind zones, if higher) determined in accordance with Section 1609.3 as follows:

1. Ultimate design wind speed from Figure 1609A plus 20-mph.
2. Ultimate design wind speed from Figure 1609B plus 10 mph
3. Ultimate design wind speed from Figure 1609C.

Component and cladding loads shall be determined for the design wind speed defined assuming terrain Exposure C, regardless of the actual local exposure. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

L102.3 Flood loads. Buildings designed and constructed in flood hazard areas defined in Section 1612.2 of the Code shall comply with Sections L102.3.1 and L102.3.2.

L102.3.1 Floors above base flood elevation. Floors required by ASCE 24 to be built above base flood elevations shall have the floor and their lowest horizontal supporting member not less than the higher of the following:

(a) Design flood elevation,
(b) Base flood elevation plus 3 feet, or
(c) advisory base flood elevation plus 3 feet, or
(d) 500-year flood, if known

L102.3.2 Flood protective works. Buildings designed and constructed in accordance with ASCE 24 shall not consider levees or floodwalls for providing flood protection during the design flood.

L102.4 Earthquake loads. In order to limit the impact of seismic events on the *building* the *building* shall comply with Section L102.4.1 and L102.4.2

L102.4.1 Seismic design importance factor. Where the ASCE 7 mapped 0.2 sec spectral response acceleration parameter, S_S, shown on Figures 1613.3.1(1), 1613.3.1(3), 1613.3.1(4) or 1613.3.1(6) is greater than or equal to 40%g, the importance factor, I, in Table 11.5-1 of ASCE 7 shall be:

1. Not less than 1.15 for Risk Category II buildings
2. Not less than 1.35 for Risk Category III buildings
3. Not less than 1.6 for Risk Category IV buildings

L102.4.2 Seismic Design Categories C, D, E and F. If the *seismic design category* is determined to be C, D, E or F in accordance with Section 1613.3.5 a site specific geotechnical report complying with the provisions of ASCE 7 Section 11.8 is required, and the building shall be designed by a *registered design professional*.

L102.5 Storm shelters. *Buildings* and structures shall be provided with storm shelters conforming to the requirements of Section 423 where required by Sections L102.5.1 through L102.5.2 of this code.

L102.5.1 Storm shelters required. Storm shelters shall be provided for occupants of buildings in accordance with Sections L102.5.1.1, L102.5.1.2 and L102.5.2.

Exceptions:

1. *Buildings* meeting the requirements for shelter design in ICC/NSSA 500.
2. Where storm shelters within 1/4-mile of the proposed *building* are available and have adequate size to accommodate the added occupant load of the proposed *building*.
3. Where the code official determines the *building* size, location or occupant load does not warrant shelters.

L102.5.1.1 Hurricane areas. In hurricane-prone regions as defined in Section 1609.2 the following buildings shall be provided with storm shelters:

1. Community halls, gymnasiums and libraries assigned to Group A3 occupancy classification.
2. Civic administration facilities assigned to Group B occupancy classification.
3. Buildings assigned to Group E, I-1, I-2, I-3, M or R occupancy classifications.
4. Buildings assigned to Risk Category I in accordance with Section 1604.5.

L102.5.1.2 Tornado areas. In areas where the shelter design wind speed for tornadoes of Figure 304.2.(1) of ICC/NSSA 500 is 160 mph or greater, tornado shelters shall be provided, except that such shelters shall not be required for buildings classified as Group U occupancies or classified as Risk Category I according to Table 1604.5.

L102.5.2 Combined hurricane and tornado shelters. Where combined hurricane and tornado shelters are provided the shelter shall comply with the more stringent requirements of ICC/NSSA-500 for both types of shelters.

L102.6 Wildland In order to limit the impact of wildland fires on the *building* the *building* shall comply with Sections L102.6.1 through L102.6.3

L102.6.1 Wildland Fires. The provisions of the *International Wildland-Urban Interface Code* shall apply to the construction, alteration, movement, repair, maintenance and use of any building, structure or premises within the wildland interface areas in this jurisdiction.

L102.6.2 Exterior walls. Exterior wall requirements shall be based on the Fire Hazard Severity specified in Table 502.1 in the *International Wildland-Urban Interface Code*.

L102.6.3 Smoke Detection. An automatic smoke detection system shall be installed throughout buildings located within areas designated by the jurisdiction as being a wild land urban interface area.

L103 Reference Standards

ASCE

ASCE 7 Minimum Design Loads for Other Structures
ASCE 24 Flood Resistant Design and Construction

ICC

ICC International Wildland-Urban Interface Code (IWUIC)

Reason: This reason statement has the following two segments to explain the reasons for this change: (A) The code change is explained with specific substantiation; and (B) General background information identifying the need for enhanced property protection and functional resilience for to strengthen the built environment;

(A)

The following are reports of dollar loss to property from wind, cold weather and fire disasters.

- The American Society of Civil Engineers reported in *Normalized Hurricane Damage in the United States*, *1900 – 2005,* National Hazard Review, ASCE 2008, that property damage from hurricanes was 81 billion dollars in 2005.
- The National Weather Service reports that U.S. property damage due to winter storms and ice exceeded 1.5 billion dollars in 2009.
- *Fire Losses in the United States During 2009* by the National Fire Protection Association, August 2010 shows that property loss due to structure fires in buildings other than one and two family dwellings was approximately 4.5 billion dollars.

Increasing the stringency of the design criteria of buildings for hazards such as wind, snow or fire results in more robust buildings. Such requirements reduce the amount of energy and resources required for repair, removal, disposal and replacement of building components and systems damaged from these disasters. A further benefit is a reduction in the amount of damaged building materials and content entering landfills.

Additional benefits are enhanced life safety, security and occupant comfort; potentially less demand on community resources required for emergency response; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future.

(B)

Minimum building requirements whether through energy codes, plumbing codes, mechanical codes, zoning codes, or basic building codes, do not encourage truly sustainable buildings. The proposal is one of several that attempt to integrate the concepts of the *Whole Building Design Guide* (WBDG) into the International Building Code as a non-mandatory Appendix. This allows adopting jurisdictions the option of incorporating code requirements into the building code to improve the resilience of the built environment without the need to add another code to the community requirements.

The WBDG, developed in partnership between the National Institute of Building Sciences (NIBS) and the Sustainable Building Industries Council (SBIC), has as its key concepts: accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable.

There are numerous references about the economic, societal, and environmental benefits that result when enhanced functional resilience for resource minimization are integrated into building design and construction. Six examples demonstrating the importance and supporting the concepts are:

1. ***Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities***
National Institute of Building Sciences Multi-Hazard Mitigation Council - 2005

One of the findings in this report is "The analysis of the statistically representative sample of FEMA grants awarded during the study period indicates that a dollar spent on disaster mitigation saves society an average of $4." The programs studied often addressed issues and strategies other than enhanced disaster resistance of buildings and other structures. However, more disaster-resistant buildings enhance life safety; reduce costs and environmental impacts associated with repair, removal, disposal, and replacement; and reduce the time and resources required for community recovery.

2. Five Years Later – Are we better prepared?
Institute for Business and Home Safety - 2010

This IBHS report states: "When Hurricane Katrina made landfall on Aug. 29, 2005, it caused an estimated $41.1 billion in insured losses across six states, and took an incalculable economic and social toll on many communities. Five years later, the recovery continues and some residents in the most severely affected states of Alabama, Louisiana and Mississippi are still struggling. There is no question that no one wants a repeat performance of this devastating event that left at least 1,300 people dead. Yet, the steps taken to improve the quality of the building stock, whether through rebuilding or new construction, call into question the commitment of some key stakeholders to ensuring that past mistakes are not repeated." This report indicates that there is a need to implement provisions to make buildings more disaster-resistant. Clearly this suggests that functional resilience should at least be integrated into the design and construction of sustainable buildings.

3. National Weather Service Office of Climate, Water and Weather Services
National Oceanic and Atmospheric Administration (NOAA) - 2010

Data provided on the NOAA website [www.weather.gov/os/hazstats.shtml] indicates that the average annual direct property loss due to natural disasters in the United States exceeds of $35,000,000,000. This does not include indirect costs associated with loss of residences, business closures, and resources expended for emergency response and management. These direct property losses also do not reflect the direct environmental impact due to reconstruction after the disasters. Functional resilience will help alleviate the environmental impact and minimize both direct and indirect losses from natural disasters.

4. Global Climate Change Impacts in the United States

U.S. Global Change Research Program (USGCRP) - 2009
The USGCRP includes the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation; National Aeronautic and Space Administration; Environmental Protection Agency, USA International Development, National Science Foundation and Smithsonian Institution

The report identifies that: "Climate changes are underway in the United States and are projected to grow. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow." The report further identifies that the: "Threats to human health will increase. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts." Key messages in the report on societal impacts include:

- "City residents and city infrastructure have unique vulnerabilities to climate change. "
- "Climate change affects communities through changes in climate-sensitive resources that occur both locally and at great distances."
- "Insurance is one of the industries particularly vulnerable to increasing extreme weather events such as severe storms, but it can also help society manage the risks."

Sustainable building design and construction cannot be about protecting the natural environment without consideration of the projected growth in severe weather. Minimum codes primarily based on past natural events are not appropriate for truly sustainable buildings. Buildings expected to have long term positive impacts on the environment must be protected from these extreme changes in the natural environment. The provisions for improved property protections are necessary to reduce the amount of energy and resources associated with repair, removal, disposal, and replacement due to routine maintenance and damage from disasters. Further such provisions reduce the time and resources required for community disaster recovery.

5. ***Sustainable Stewardship -*** *Historic preservation plays an essential role in fighting climate change ,Traditional Building,*
National Trust for Historic Preservation - 2008

In the article Richard Moe summarizes the results of a study by the Brookings Institution which projects that by 2030 we will have demolished and replaced 82 billion square feet of our current building stock, or nearly 1/3 of our existing buildings, largely because the vast majority of them weren't designed and built to last any longer. Durability, as a component of functional resilience, can reduce these losses.

6. **Opportunities for Integrating Disaster Mitigation and Energy Retrofit Programs**
Senate Environment and Public Works Committee Room, Dirksen Senate Office Building, Washington, D.C. - 2010

During this panel discussion a representative of the National Conference of State Historic Preservation Officers noted that more robust buildings erected prior to 1950 tend to be more adaptable for reuse and renovation. Prior to the mid-1950s most local jurisdictions developed their own building code requirements that uniquely addressed the community's needs, issues and concerns. Pre-1950 building codes typically resulted in more durable and robust construction that lasts longer.

The total environmental impact of insulation, high efficiency equipment, components, and appliances, low-flow plumbing fixtures, and other building materials and contents are relatively insignificant when rendered irreparable or contaminated and must be disposed of in landfills after disasters. The US Army Corps of Engineers estimated that after Hurricane Katrina nearly 1.2 billion cubic feet of building materials and contents ended up in landfills. This is analogous to stacking enough refrigerators a fifth of the way to the moon or placing them end to end around the equator of the Earth twice.

Cost Impact: The code change proposal will increase the cost of construction.

Staff note: This proposal is one of several proposals adding a new appendix L. The intention of the proponent has been indicated that the contents of the proposals be combined if they should be approved into a single Appendix L Titled "Appendix L, Building Resilience."

S338-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

APPENDIX L (NEW)-S-SKALKO-STAFFORD.doc

S339–12
1710.5.1

Proponent: Julie Ruth, P.E., JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA) (julruth@aol.com)

Revise as follows:

1710.5.1 Exterior windows and doors. Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440. The *label* shall state the name of the manufacturer, the *approved* labeling agency and the product designation as specified in AAMA/ WDMA/CSA101/I.S.2/A440. Exterior side-hinged doors shall be tested and *labeled* as conforming to AAMA/WDMA/CSA101/I.S.2/A440 or comply with Section 1710.5.2. Products in *Risk Category* I or II buildings that are tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3 if one of the following is met:

1. The required design pressure for the fenestration product does not exceed 60 psf or
2. All glass in the fenestration product is tempered or laminated.

Reason: The appropriate deflection limit for framing members supporting glass has been widely debated within the fenestration industry for many years.

Section 2403.2 of the 2012 IBC requires testing or analysis signed by a registered design professional for any glazed assembly when one or more sides of the glass is not firmly supported. Section 2403.3 defines firm support as not deflecting more than 1/175 of the length of glass edge being supported. These provisions have been in the IBC since its first edition in 2000.

Section 1710.5.1 provides an alternative to the requirements of Section 2403.2 and 2403.3 for fenestration products that are tested and labeled in accordance with AAMA/WDMA/CSA 101/I.S.2/A440. This is based upon the referenced specification providing a level of review equivalent to the requirements of Sections 2403.2 and 2403.3.

All editions of the IRC require exterior windows to be tested and labeled to AAMA/WDMA/CSA 101/I.S.2/A440, or one of its predecessor specifications. The provisions of Section 2403.2 and 2403.3 of the 2012 IBC do not occur in the 2012 IRC, or in any of its predecessor editions.

There has been strong evidence that homes built under the IRC have performed well under high wind conditions. This suggests that AAMA/WDMA/CSA 101/I.S.2/A440 adequately addresses all structural design considerations for fenestration in homes built under the IRC, including deflection of glass supporting framing. Additional requirements for framing deflection of fenestration under these applications do not appear necessary.

The scope of the IRC, however, is limited to one and two family dwellings and townhouses three stories or less in height, in regions with design wind speeds of 110 mph or less. The scope of the IBC is all buildings not included within the scope of the IRC. Hence, the IBC applies to all occupancies, and buildings of much greater height than those addressed in the IRC, including those in regions with much higher design wind speeds.

Use of the alternative provided in Section 1710.5 of the IBC for all fenestration in all buildings regardless of the intended occupancy of the building, its height, type of construction or design wind pressures may not be conservative. Therefore the scope of this alternative is being revisited at this time.

This proposal provides a moderately conservative solution to the question – Just how broadly should this alternative be permitted to be used?

It is appropriate to retain the current alternative to Sections 2403.2 and 2403.3 in the IBC for buildings that are similar to those within the scope of the IRC. This includes buildings of similar height in the same design wind speed region if they are not of an occupancy that is required to be designed to a greater level of stringency by the IBC for other reasons.

The only provisions of the IBC that distinguish design wind pressure of a building based upon its use or occupancy are the Risk Category provisions. Homes built under the IRC are Risk Category II. Risk Category I buildings are designed to a lower level of life safety than Risk Category II. Therefore this proposal limits the application of the alternate in Section 1710.5 to buildings in Risk Category I and II.

Based upon Tables R301.2 (2) and R301.2 (3) of the 2012 IRC, the highest possible required design pressure rating for components and cladding on a home built under the 2012 IRC is 54.4 psf, based upon the following calculation:

Max. $DP_{req'd}$ = 29.1 psf (fenestration < 10 sq. ft. in size in zone 5 – near the corner of the building) X 1.87 (opening 60 feet above grade in Exposure D) = 54.4 psf

This proposal rounds that number up to the next nearest multiple of 10, which is 60 psf.

AAMA/WDMA/CSA 101/I.S.2/A440 permits Performance Class R windows to be rated up to 90 psf even if their framing deflects more than L/175 under design pressure. Therefore, requiring additional testing and analysis by a Registered Design Professional for windows with Design Pressure ratings greater than 60 psf is more conservative than the referenced specification.

This proposal also permits the use of either tempered or laminated glass throughout the fenestration product as an alternate to Sections 2403.2 and 2403.3 in Risk Category I and II buildings. The concern of Sections 2403.2 and 2403.3 is the potential breakage of glass due to deflection of the supporting framing. If the product is glazed entirely with tempered or laminated glass this is less of a concern for 2 reasons.

1) Both tempered and laminated glass are capable of resisting higher loads than a similar thickness of the more commonly used annealed glass. AAMA/WDMA/CSA 101/I.S.2/A440 requires the fenestration products to be glazed with the weakest glass permitted

by ASTM E1300 for that particular opening, prior to testing for resistance to structural load. In most cases that weakest glass would be annealed. The strength characteristics of tempered or laminated glass are typically 2 to 4 times greater than those of annealed glass in the same thickness.

2) If broken both tempered and laminated glass has less of a tendency to result in large shards of glass being flung from the opening than annealed glass. Tempered glass has a tendency to shatter into small pieces with less sharp edges than annealed glass. The plastic interlayer of laminated glass tends to hold any broken or shattered glass in place rather than permitting it to be flung from the opening.

Therefore the use of tempered or laminated glass is considered to provide an additional level of safety, particularly in openings with a required design pressure rating of 60 psf or greater.

This proposal permits the alternate of Section 1710.5 to continue to be used in those applications where evidence exists that it is conservative to do so, while addressing concerns that its use may not be appropriate for all buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

S339-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1710.5.1#2-S-RUTH.doc

2012 PROPOSED CHANGES TO THE INTERNATIONAL FUEL GAS CODE

FUEL GAS CODE COMMITTEE

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Dallas, TX

William T. Hamilton, CGE
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Manager, Technical Training
UGI Utilities, Inc.
Reading, PA

Dennis L. Holden
Rep: American Gas Association
Director, Customer Relations/
District Operations
Southwest Gas Corporation
Tucson, AZ

Lynn S. Niblock, MCP, CBO, CEO, CMO, CPO
Director of Code Enforcement & Special
Projects
Iredell County
Statesville, NC

William Olinger
Plumbing Inspector
East Hanover, NJ 07936

Andrea Lanier Papageorge, JD, MBA
Rep: American Gas Association
Manager, Codes and Standards
AGL Resources
Atlanta, GA

Thomas C. Pitcherello
Code Specialist
State of New Jersey – Dept. of Community
Affairs-Div. of Codes & Standards
Trenton, NJ

Timothy H. Swanson, CBCO/CFCO
Chief Building Official
City of Greeley
Greeley, CO

Staff Secretariat:
Gregg Gress
Senior Technical Staff
International Code Council
Country Club Hills, IL

AGA Liaison
Jim Ranfone
Managing Director
American Gas Association
Washington, DC

TENTATIVE ORDER OF DISCUSSION 2012 PROPOSED CHANGES TO THE INTERNATIONAL FUEL GAS CODE

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

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

FG1-12
FG2-12
FG3-12
FG4-12
FG5-12
FG6-12
FG7-12
FG8-12
FG9-12
FG10-12
FG11-12
FG12-12
FG13-12
FG14-12
FG15-12
FG16-12
FG17-12
FG18-12
FG19-12
FG20-12
FG21-12
FG22-12
FG23-12
FG24-12
FG25-12
FG26-12
FG27-12
FG28-12
FG29-12
FG30-12
FG31-12
FG32-12
FG33-12
FG34-12
FG35-12
FG36-12
FG37-12
FG38-12
FG39-12

FG1 – 12
301.15

Proponent: Bob Scott, Kye Lehr, Daryl Kuiper, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards, representing self; Monty Hood, Plumbing Inspector, representing the state of Colorado

Revise as follows:

301.15. **Prohibited Locations.** The appliances, equipment and systems regulated by this code shall not be located in an elevator shaft. <u>Gas-fired appliances shall not be located under egress stairs.</u>

Reason: Locating gas appliances under stairs may cause a fire that could trap persons and prevent escape.

Cost Impact: None.

FG1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

301.15-FG-SCOTT-LEHR-KUIPER-HOOD

FG2 – 12
303.3

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

303.3 Prohibited locations. Appliances shall not be located in sleeping rooms, bathrooms, toilet rooms, storage closets~~ or surgical rooms~~, or in a space that opens only into such rooms or spaces, except where the installation complies with one of the following:

1. The appliance is a direct-vent appliance installed in accordance with the conditions of the listing and the manufacturer's instructions.
2. Vented room heaters, wall furnaces, vented decorative appliances, vented gas fireplaces, vented gas fireplace heaters and decorative appliances for installation in vented solid fuel-burning fireplaces are installed in rooms that meet the required volume criteria of Section 304.5.
3. A single wall-mounted unvented room heater is installed in a bathroom and such unvented room heater is equipped as specified in Section 621.6 and has an input rating not greater than 6,000 Btu/h (1.76 kW). The bathroom shall meet the required volume criteria of Section 304.5.
4. A single wall-mounted unvented room heater is installed in a bedroom and such unvented room heater is equipped as specified in Section 621.6 and has an input rating not greater than 10,000 Btu/h (2.93 kW). The bedroom shall meet the required volume criteria of Section 304.5.
5. The appliance is installed in a room or space that opens only into a bedroom or bathroom, and such room or space is used for no other purpose and is provided with a solid weather-stripped door equipped with an approved self-closing device. ~~All~~ Combustion air shall be taken directly from the outdoors, ~~in accordance with Section 304.6~~ indoors or a combination of both in accordance with Section 304. Combustion air openings in the enclosure shall not communicate with the prohibited locations listed in this section.

Reason: No designer would ever install a fuel burning appliance in a surgical room and there could conceivably be a long list of other locations where fuel burning appliances should not be installed. There is no technical justification to limit combustion air to outdoor air only in this scenario. Indoor air can be effectively utilized when openings are sized per the code and those openings do not connect the enclosure with the various rooms listed. This could save money avoiding cutting holes in exterior walls and searching for a path for ducts to run which could be very difficult to achieve.

Cost Impact: This proposal may decrease the cost of construction**.**

FG2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.3-FG-MCMANN

FG3 – 12
303.3.1 (New); IMC: 901.5 (New), 901.6 (New)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IFGC COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IFGC

Add new text as follows:

303.3.1 Fireplaces and decorative appliances in Group I-2 occupancies. In addition to the requirements of Section 303.3, fuel gas-fired fireplaces and decorative appliances in Group I-2 occupancies shall not be located in sleeping rooms, storage closets, surgical rooms, toilet rooms and bathrooms located in the patient sleeping or dwelling units. Fuel gas-fired fireplaces and decorative appliances are permitted in other areas that open into such rooms or spaces only where the installation complies with all of the following:

1. Combustion air is taken directly from the outdoors,
2. Flue gases are discharged directly to the outdoors.
3. Appliance combustion chambers are separated from the environmental air on the interior of the building.
4. Appliances shall automatically shut down and stop fuel flow upon any of the following events:
   - 4.1 when temperatures exceed the appliance listing,
   - 4.2 when there is failure to ignite
   - 4.3 upon activation of the fire alarm system
5. Appliance controls are located in an approved restricted or locked location.
6. A carbon monoxide detector with a local alarm shall be provided and installed in accordance with Section 908.7 of the IBC.

PART II – IMC

Add new text as follows:

901.5 Fuel gas-fired Fireplaces and appliances in Group I-2. Fuel gas-fired fireplaces and decorative appliances located within smoke compartments containing patient sleeping rooms and surgical rooms in Group I-2 occupancies shall be installed in accordance with Section 303.3.1 of the IFGC.

901.6 Solid fuel-burning fire places and appliances in Group I-2. Solid fuel-burning fireplaces and appliances shall not be located in Group I-2 occupancies.

> **Exception:** Solid fuel-burning fireplaces and appliances shall not be prohibited in Group I-2 nursing homes provided that they are not located in smoke compartments that contain patient sleeping rooms.

Reason: This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx .

The AHC is proposing a revision to address some of the oversights in the I-Codes of long-standing and operational requirements for hospitals and healthcare facilities that has not been specifically addressed. The requirements being proposed in this code change have been long-standing provisions of the construction and operational requirements for healthcare facilities.

Justification: The language proposed in the IFGC prescribes the limitations and conditions to provide the necessary safety and limitations of hazards found within the healthcare environments to the fire and ignition sources inherent to all fireplaces and gas-fired appliances. Combustion air is restricted from being drawn from a healthcare environment for more than the last decade. It is standard practice and operational procedure to control the ignition sources in these occupancies that can contain combustible, flammable (and sometimes even explosive) material. Fire risks need to be limited to the maximum extent feasible and specific requirements for these facilities are not currently or completely addressed in the I-Codes. The physical separation of the combustion chambers of fireplaces and gas-fired equipment is required to separate and provide a barrier between the ignition sources and the environmental air within healthcare occupancies. All combustion air is required to be taken directly from the exterior of the building with one exception that is already provided for in IFGC Section 303.3.

The solid fuel burning fireplaces and appliances (decorative or heating) present open flames that cannot otherwise be controlled or extinguished like similar gas-fired appliances. The attention to and the tending of the open flames from solid fuel burning appliances require the opening any surrounding compartment while the flames and ignition sources are present; thereby, exposing the I-2 environment (within the patient smoke compartment) to the ignition sources. When gas-fired appliances are utilized, the ability to completely control the fuel source and all open flames and ignition sources is possible and does not require exposure to or tending of solid fuel burning materials . The AHC committee is recommending the restriction of solid-fuel burning fireplaces and appliances in the I-2 occupancy.

Future submissions to proposals to the IFC are being drafted to clarify, restrict and limit the ignition source hazards in healthcare occupancies that will reference these requirements being proposed in the IBC, IMC AND IFGC. The code sections that address the installation of fuel gas-fire fireplaces and appliances will also provide alternative means for compliance for existing facilities. Given the hazards present with these appliances in the I-2 Occupancies, the proposed IFC requirements will be 'retro-active' requirements for healthcare occupancies (I-2); please note, these are not new requirements for the I-2 Occupancy facilities but are needed in the I-Codes for coordination of the long-standing provision of the construction and operational requirements for healthcare facilities.

Cost Impact: No increase to the cost of construction for these facilities is associated with these code changes. This change is consistent with existing federal certification requirements.

FG3-12

PART I – INTERNATIONAL FUEL GAS CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.3.1-FG-Williams-Adhoc

FG4 – 12
303.4, 303.4.1 (New), 303.4.2 (New)

Proponent: Bob Scott, Kye Lehr, Daryl Kuiper, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards, representing self; Dennis Gardner, State of Colorado Plumbing and Gas Inspector

Revise as follows:

303.4 Protection from vehicle impact damage. Appliances shall not be installed in a location subject to vehicle impact damage except where protected by ~~an~~ *approved* ~~means~~ physical barriers that comply with Section 303.4.1 or guard posts that comply with Section 303.4.2.

303.4.1 Physical barriers. Physical barriers shall be a minimum of 36” (614mm) in height and shall resist a force of 12,000 pounds (53 375N) applied 36 inches (914mm) above the adjacent floor surface.

303.4.2 Guard Posts. Guard posts shall be:

1. Constructed of steel pipe not less than 4 inches (102mm) in diameter and shall be filled with concrete.
2. Spaced not more than 4feet (1219mm) between posts on center.
3. Set not less than 3 feet (914mm) deep in a concrete footing not less than15 inches (381mm) in diameter.
4. Set with the top of the posts not less than 3 feet (914mm) above the floor.
5. Located not less than 3 feet (914mm) from the protected appliance.

Reason: No guidelines are given in this section for *approved* means. It took time and a lot of research to find these requirements which are only found in the International Fire Code. By incorporating these requirements in the code we have once again clarified the requirements for the Architect, Engineer, installer and the inspector. Making sure that what has been installed is adequate protection of gas fired appliance in the direct path of a vehicle, making it safer for the home owner, business owner and occupants.

Cost Impact: None, these barriers are already required by code, by adding the text it just insures the barriers are installed properly for life, health and safety of the occupants within the building.

FG4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.4-FG-SCOTT-LEHR-KUIPER-GARDNER

FG5–12
307.6

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Add new text as follows:

307.6 Condensate pumps. Condensate pumps located in uninhabitable spaces, such as attics and crawl spaces, shall be connected to the appliance or equipment served such that when the pump fails, the appliance or equipment will be prevented from operating. Pumps shall be installed in accordance with the manufacturers' installation instructions.

Reason: Pumps that are not connected in this fashion will permit the appliances to keep operating, spilling waste water where ever the appliance is located. When this condition continues over time, it could result in damage to building components or other property. This overflow condition may result in mold issues among other things. Most pump manufacturers already have this feature incorporated into the pump but the code does not require it to be connected. Damage as a result of not connecting this feature could prove to be very costly. This is not as much of a concern when appliances are readily accessible to occupants where leakage may be noticed in a timely manner.

Cost Impact: None

FG5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.6 (NEW)-FG-MCMANN

FG6– 12
308.2, Chapter 8

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

308.2 Reduction table. The allowable *clearance* reduction shall be based on one of the methods specified in Table 308.2 or shall utilize ~~an~~ <u>a reduced clearance protective</u> assembly *listed* ~~for such application~~ <u>and labeled in accordance with UL 1618</u>. Where required clearances are not listed in Table 308.2, the reduced clearances shall be determined by linear interpolation between the distances listed in the table. Reduced clearances shall not be derived by extrapolation below the range of the table. The reduction of the required clearances to combustibles for *listed* and *labeled* appliances and *equipment* shall be in accordance with the requirements of this section except that such clearances shall not be reduced where reduction is specifically prohibited by the terms of the *appliance* or *equipment* listing [see Figures 308.2(1) through 308.2(3)].

Add the standard to Chapter 8 as follows:

UL
<u>1618-2009 Wall Protectors, Floor Protectors, and Hearth Extensions……………308.2</u>

Reason: UL 1618 is the ANSI standard used to list reduced clearance protective assemblies. UL 1618 is already referenced in the International Mechanical Code for reduced clearances.

Cost Impact: None

FG6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.2-FG-EUGENE

FG7 – 12
311 (New)

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Add new text as follows:

Section 311
Insulation protection

311.1 Protection of piping Insulation. Pipe insulation exposed to the weather shall be listed and labeled for exterior use or shall be protected in accordance with the manufacturer's installation instructions. Insulation subject to physical damage shall be protected by shields or by other approved methods.

Reason. Pipe insulation exposed to the elements needs to be protected from solar and UV effects and should be listed for such exposure when applied in this situation. Insulation must also be protected in locations where maintenance or other activity takes place that may damage the installation. This is information the plan reviewer, inspector or installer would need to be aware of at the planning stage of a project.

Cost Impact: None

FG7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

311 (NEW)-FG-MCMANN

FG8 – 12
401.9

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

401.9 Identification. Each length of pipe and tubing and each pipe fitting, utilized in a fuel gas system, shall bear the identification of the manufacturer.

> **Exception:** The manufacturer identification for fittings and pipe nipples shall be on each piece or shall be printed on the fitting or nipple packaging or provided documentation.

Reason: The exception would allow identification of fittings to be provided on or with the packaging. Some piping fittings, short nipples for example, do not have the physical room for a manufacturers mark.

Cost Impact: The code change proposal will not increase the cost of construction.

FG8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.9-FG-RANFONE

FG9 – 12
401.9

Proponent: Robert Torbin, representing Omega Flex, Inc. (bob.torbin@omegaflex.net)

Revise as follows:

401.9 Identification. Each length of pipe and tubing and each pipe fitting, utilized in a fuel gas system, shall bear the identification of the manufacturer <u>and the mark of an approved third-party testing or certifying agency.</u>

Reason: There is no reasonable and cost-effective manner for the local code enforcement official to determine if the installed piping and fittings have actually been tested or certified without the mark of the testing/certifying agency identified on the piping/fitting. There is no practical way to transfer the paperwork associated with these products from the manufacturer to the plumbing supply house to the installer plumber and then to the local plumbing inspector.

Cost Impact: The code change proposal will not increase the cost of construction. If the manufacturer is required to have its piping and fitting products tested and certified as part of its compliance with the referenced standard, then the cost of adding an additional mark (the manufacturer's name is already required) to the piping and fittings is negligible or zero. CSST gas piping and fittings are currently marked with both the manufacturer's name and testing/certifying agency. However, the cost savings in the field will be significant with reductions in paperwork chasing and inspection labor.

FG9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.9-FG-TORBIN

FG10 – 12
403.10.1

Proponent: Bob Scott, Kye Lehr, Daryl Kuiper, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards, representing self; Dennis Gardner, State of Colorado Plumbing and Gas Inspector

Revise as follows:

403.10.1 Pipe joints. Pipe joints shall be threaded, flanged, brazed or welded. Where nonferrous pipe is brazed, the brazing materials shall have a melting point in excess of 1,000°F (538°C). Brazing alloys shall not contain more than 0.05-percent phosphorus. Welded pipe shall be installed by personnel who are qualified by testing to the requirements of the A.S.M.E. Boiler and pressure Vessels Code, Section IX. Welded joints shall be performed in accordance with the same requirements under which the welder was tested.

Reason: There are presently no requirements for welders or welds to meet under the IFGC code. This would set a minimum standard for the welder, and a minimum standard that all welded gas piping must meet. I have had piping welded in a one pass process, and after the problem was found the welds did not pass the testing requirements under which the welder was tested. In short, the welder short cut the process because there were no guidelines in the code to follow, thus bringing into question the strength and safety of the gas pipe welds.

Cost Impact: None, This process should already be followed.

FG10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.10-FG-SCOTT-LEHR-KUIPER-GARDNER

FG11 – 12
403.10.1, 403.10.2, 403.10.3

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

Revise as follows:

~~**403.10.1 Pipe joints.** Pipe joints shall be threaded, flanged, brazed or welded. Where nonferrous pipe is brazed, the brazing materials shall have a melting point in excess of 1,000°F (538°C). Brazing alloys shall not contain more than 0.05-percent phosphorus.~~

<u>**403.10.1 Pipe and tubing joints.** Joints shall be threaded, flanged, brazed or welded. Brazed joints between copper pipe or tubing and fittings shall be made with brazing alloys having a liquid temperature above 1,000°F (538°C). All joints surfaces to be brazed shall be cleaned. An *approved* brazing flux shall be applied to the joint surfaces where required by manufacturer's recommendation. The joints shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal and shall be applied at the point where the pipe or tubing enters the socket of the fitting.</u>

403.10.2 <u>**Pressed**</u> ~~**Tubing**~~ **joints.** ~~Tubing joints shall be made with *approved* gas tubing fittings, brazed with a material having a melting point in excess of 1,000°F (538°C) or made with~~ <u>P</u>~~p~~ress-connect fittings <u>shall</u> comply with ANSI LC-4. <u>The joint shall be pressed using the tool recommended by the fitting manufacturer.</u> ~~Brazing alloys shall not contain more than 0.05-percent phosphorus.~~

403.10.3 Flared joints. Flared joints shall be used only in systems constructed from nonferrous pipe and tubing where experience or tests have demonstrated that the joint is suitable for the conditions and where provisions are made in the design to prevent separation of the joints. <u>Flared joints shall be made by a tool designed for that operation.</u>

Reason: The above proposal combined two similar code sections and provides important language from the standards to aid the end user.

Cost Impact: This code change will not increase the cost of construction.

FG11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.10.1-FG-FEEHAN

FG12 – 12
404.5

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

404.5 ~~Piping~~ Fittings in concealed locations. ~~Portions of a piping system~~ Fittings installed in concealed locations shall be limited to the following types: ~~not have unions, tubing fittings, right and left couplings, bushings, compression couplings and swing joints made by combinations of fittings.~~

1. Threaded elbows, tees and couplings
2. Brazed fittings
3. Welded fittings
4. Fittings listed to ANSI LC-1/CSA 6.26, Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST), or ANSI LC-4, Press-Connect Copper and Copper Alloy Fittings for Use in Fuel Gas Distribution Systems.

~~Exceptions:~~

~~1. Tubing joined by brazing.~~
~~2. Fittings listed for use in concealed locations.~~

Reason: There are three revisions requested by this proposal:

1. Specify the actual standards for fittings listed for use in concealed locations. Currently, these standards are LC-1 and LC-4. This revision will improve enforcement.
2. Allow the use of right and left couplings. These fittings are often used in large gas piping systems to ease the disassembly of a middle portion of the piping system. These couplings have historically been allowed by several large jurisdictions, including New York City.
3. Reorganize the requirements into a list format to improve clarity.

All of these changes have been adopted into the 2012 National Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

FG12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.5-FG-RANFONE

FG13 – 12
404.6

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

404.6 ~~Underground penetrations prohibited.~~ Piping through Foundation Wall. ~~Gas piping shall not penetrate building foundation walls at any point below grade. Gas piping shall enter and exit a building at a point above grade and the annular space between the pipe and the wall shall be sealed.~~ Underground piping installed through the outer foundation or basement wall of a building, shall be encased in a protective sleeve or protected by an approved device or method. The space between the gas piping and the sleeve and between the sleeve and the wall shall be sealed to prevent entry of gas and water.

Reason: A change adopted into the 2012 edition would prohibit gas piping from penetrating a foundation wall below grade. This change was adopted without evidence that such penetrations have resulted in a safety concern. Below grade penetrations have long been permitted and have proven to be safe installation method. The revised language would reinstate this allowance.

Cost Impact: The code change proposal will not increase the cost of construction.

FG13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.6-FG-RANFONE

FG14 – 12
404.6

Proponent: Dan Buuck, representing National Association of Home Builders (NAHB) (dbuuck@nahb.org)

Delete and substitute as follows:

~~**404.6 Underground penetrations prohibited.** Gas *piping* shall not penetrate building foundation walls at any point below grade. Gas *piping* shall enter and exit a building at a point above grade and the annular space between the pipe and the wall shall be sealed.~~

404.6 Piping through foundation wall. Where installed below grade through the outer foundation or basement wall of a building, gas *piping* shall be encased in a protective sleeve or shall be protected by an approved device or method. The sleeve shall extend into the building at least 2 inches (508 mm) from the face of the foundation wall and at least 18 inches (457 mm) from the exterior wall face. The annular space between the gas *piping* and the sleeve and between the sleeve and the wall shall be sealed to prevent the entrance of gas and moisture.

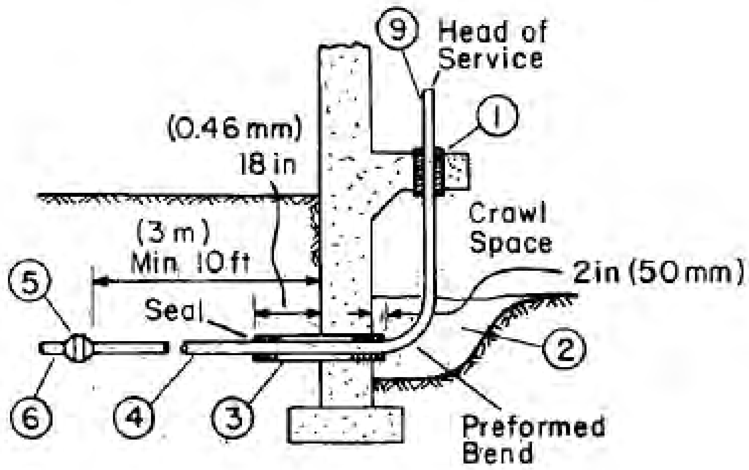
Reason: The conventional installation practice of allowing piping to go through foundation walls below grade should not be prohibited. This is an installation method that has been used for decades. No data was ever presented that would show a safety problem or inadequacy when a proper installation and sealing of the opening was installed in accordance with the IFGC. Furthermore, this proposal will coordinate the IFGC provisions with other industry fuel gas codes.

If there is an assumed problem that gas in the soil may be allowed to enter the building around the gas piping, then that should be specifically addressed in this section. Banning an installation method outright is the same as banning a product or material. If a method is found to meet the safety requirements of the code, then it should be allowed by the same. (See Section 105.2 Alternative materials, methods, appliances and equipment.)

It could be said that the current language of this section is faulty, because it does not provide intent. It simply bans a method. This proposal seeks to add the text “shall be sealed to prevent the entrance of gas and moisture” in order to give code officials the language necessary to identify the intent. It gives them the tools they need to ensure a safe installation—possibly by approving an alternate method. Fig. 1 shows a gasket that would provide effective protection against gas leaking into the building as it is designed to create a reliable seal against ground water. It is included as an example of a method which apparently was not considered when the current code language was adopted.

Requiring above grade entry points into the foundation will require extra piping and joints, both inside and outside, exposing the piping system to physical damage and increased risk of leakage on the outside of buildings as well as within the building. This increase in outside exposure will be particularly significant in a city or at congested commercial locations where piping must come above grade at times through sidewalks at the front or rear of the building or come through the ground in public ways before turning to enter the foundation or building. This will also present practical issues of locating the exterior and interior piping system to have entry points that are compatible with the building design, i.e., doorways, loading docks, accessible entry systems (ramps) etc. There will also be additional costs in these circumstances when the underground piping must be relocated to accommodate above-grade obstacles. How can this be accomplished in cities where streets, alleys, and sidewalks surround buildings? Currently gas meters are contained in below-grade vaults from where the gas piping enters the building. These installations are not underground, but the piping would still need to be routed up out of the vault to comply with this section (see definition of “grade”). This would arguably cause greater safety concerns due to the potential for impact from vehicles and pedestrians.

Finally, the insurance industry apparently has no concerns about below-grade gas piping penetrations as they provide details for a correct installation in the current edition of Factory Mutual’s Property Loss Prevention Data Sheets (see Figure below). According to FM Global’s engineering records, the 18-inch extension on the outside face of the foundation wall was added as an “additional precaution to prevent breakage and corrosion of buried pipe.”



(c.)

1. Pipe sleeve and seal of cement grout.
2. Excavation around inside pipe; at least 18 in. (0.46 m) clearance.
3. Pipe sleeve and seals of cement grout. Sleeve is copper when inner pipe is copper. Sleeve is steel with field- or shop-applied wrapping and coating when inner pipe is steel
4. Wrapped and coated steel pipe without joints or unwrapped copper tubing without joints.
5. First outside pipe joint.
6. Pitch to drain back to yard system.
7. Meter located in occupied space or out of doors.
8. Drip pot (if necessary) piped to outdoors.
9. Unwrapped pipe.

Cost Impact: The code change proposal will not increase the cost of construction.

FG14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.6-FG-BUUCK

FG15 – 12
404.7, 404.7.1 (New), 404.7.2 (New)

Proponent: Shawn Strausbaugh, Arlington County, VA, representing PMG CAC

Revise as follows:

404.7 Protection against physical damage. In concealed locations where *piping*, other than black or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1-1/2 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. ~~Protective steel~~ Such shield plates shall have~~ing~~ a ~~minimum~~ thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage). Such plates shall cover the area of the pipe where the member is notched or bored and shall extend not less than 4 inches (102 mm) above sole plates, and below top plates and to each side of a stud, joist, rafter or similar member.

404.7.1 Formed steel framing members. *Piping*, other than black or galvanized steel, shall not be installed within the channel of a formed steel framing member except where the piping is not less than 1-1/2 inches from the backside of any fastening face of the member.

404.7.2 Piping installed parallel to framing members. In concealed locations where *piping*, other than black or galvanized steel, is installed parallel to studs, joists, rafters or similar members less than 1-1/2 inches (38 mm) from the nearest edge of the member, such pipe shall be protected along its length by steel shield plates that comply with the requirements of Section 404.7.

Reason: Like the IPC, Section 404.7 does not address pipe or tubing run down the side of a stud or inside of a "C" channel metal stud or rafter. Such installations are subject to penetrations but the code addresses only holes and notches for pipe and tubing that runs perpendicular to the framing member. The NEC treats wiring that runs parallel to framing members the same as wiring that runs perpendicular. The IMC, IFGC and IPC need to catch up. If the sheeting material fasteners miss a framing member, they can easily penetrate piping which is why the code requires the protection shield to extend 4 inches on both sides. Placing piping parallel to a member, either on the side or within a channel, exposes the piping to penetration, yet current code addresses only perpendicular penetrations.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This code change proposal will increase the cost of construction.

FG15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.7-FG-STRAUSBAUGH.PMGCAC

FG16 – 12
404.8.1, 404.8.2, 404.14.1, 404.14.2

Proponent: Shawn Strausbaugh, Arlington County, VA, representing PMG CAC

Revise as follows:

~~**404.8.1 Conduit with one end terminating outdoors.** The conduit shall extend into an occupiable portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas *piping* shall be sealed to prevent the possible entrance of any gas leakage. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor. If the end sealing is capable of withstanding the full pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe. Such conduit shall extend not less than 4 inches (102 mm) outside the building, shall be vented above grade to the outdoors andshall be installed so as prevent the entrance of water and insects.~~

~~**404.8.2 Conduit with both ends terminating indoors.** Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in an accessible portion of the building and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.~~

404.8 Piping in solid floors. Piping in solid floors shall be laid in channels in the floor and covered in a manner that will allow access to the piping with a minimum amount of damage to the building. Where such piping is subject to exposure to excessive moisture or corrosive substances, the piping shall be protected in an approved manner. As an alternative to installation in channels, the piping shall be installed in a conduit of Schedule 40 steel, wrought iron, PVC or ABS pipe in accordance with Section 404.8.1 or 404.8.2. <u>Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in an accessible portion of the building and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.</u>

~~**404.14.1 Conduit with one end terminating outdoors.** The conduit shall extend into an occupiable portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas *piping* shall be sealed to prevent the possible entrance of any gas leakage. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor. Where the end sealing is capable of withstanding the full pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe. Such conduit shall extend not less than 4 inches (102 mm) outside of the building, shall be vented above grade to the outdoors and shall be installed so as to prevent the entrance of water and insects.~~

~~**404.14.2 Conduit with both ends terminating indoors.** Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in an accessible portion of the building and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.~~

404.14 Piping underground beneath buildings. Piping installed underground beneath buildings is prohibited except where the piping is encased in a conduit of wrought iron, plastic pipe, steel pipe or other approved conduit material designed to withstand the superimposed loads. The conduit shall be protected from corrosion in accordance with Section 404.11 and shall be installed in accordance with Section 404.14.1 or 404.14.2. <u>Where the conduit originates and terminates within the same building, the conduit shall originate and terminate in an accessible portion of the building and shall not be sealed. The conduit shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.</u>

Reason: Sections 404.8.1 and 404.14.1 are trumped by Section 404.6 and although they would still apply to a very limited type of installation, they give the appearance of a direct conflict with Section 404.6 and have caused interpretation issues. There is no actual conflict, but the main application of these sections was for bringing gas piping into or out of a building below grade which is now expressly prohibited by Section 404.6. These sections would now only apply to gas piping running from point A to point B within the building. It is extremely unlikely that anyone would use these sections considering that Sections 404.8.2 and 404.14.2 provide a much simpler option that does not require a vent to the outdoors. Sections 404.8.1 and 404.14.1 should be deleted to avoid confusion and because they have almost no practical application value. The utility of these sections has been eliminated by the Section 404.6.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This code change proposal will not increase the cost of construction.

FG16-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.8.1-FG-STRAUSBAUGH.PMGCAC

FG17 – 12
404.14

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

404.14 Piping underground beneath buildings. Piping installed underground beneath buildings is prohibited except where the piping is encased in a conduit of wrought iron, plastic pipe, steel pipe or other approved conduit material designed to withstand the superimposed loads <u>or is encased in a listed encasement system</u>. The conduit shall be protected from corrosion in accordance with Section 404.11 and shall be installed in accordance with Section 404.14.1 or 404.14.2.

Reason: To permit the use of an encasement system that is listed. This change has been adopted into the 2012 National Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

FG17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.14-FG-RANFONE

FG18 – 12
404.14

Proponent: Robert Torbin, representing Omega Flex, Inc. (bob.torbin@omegaflex.net)

Revise as follows:

404.14 Piping underground beneath buildings. Piping installed underground beneath buildings is prohibited except where the piping is encased in a conduit of wrought iron, plastic pipe, steel pipe, or other approved conduit material designed to withstand the superimposed loads <u>or within an encasement system listed for installation beneath buildings</u>. The conduit shall be protected from corrosion in accordance with Section 404.11 and shall be installed in accordance with Section 404.14.1 and 404.14.2.

Reason: ICC Evaluation Service has previously evaluated these types of encasement systems and has issues PMG listings. (ICC-ES PMG 1052) The 2012 National Fuel Gas Code Section 7.1.6 recognizes this type of conduit system. Use of pre-assembled encasement systems streamlines the installation of gas piping beneath builds, and also eliminates underground joints on both the conduit and internal gas piping. This will improve safety (no potential leakage sites) when installing such systems.

Cost Impact: The code change proposal will not increase the cost of construction. The use of encasement systems results in cost savings because the piping and encasement are installed simultaneously. This avoids the labor cost of separately installing the conduit and piping. In addition, the sealing and venting methods (when required) are also integrated within the encasement system, thus eliminating the need to separately assemble sealing and venting components onto standard conduit.

FG18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.14-FG-TORBIN

FG19 – 12
404.18 (New)

Proponent: Shawn Strausbaugh, Arlington County, VA, representing PMG CAC

Add new text as follows:

404.18 Pipe cleaning. The use of a flammable or combustible gas to clean or remove debris from a piping system shall be prohibited.

Reason: The U.S. Chemical Safety and Hazard Investigation Board has recommended that the ICC include the proposed text in the applicable codes. This is in reaction to a tragic accident that occurred at a power plant in Connecticut in 2010. It is unsafe and unnecessary to use fuel gas as the medium to cleanse piping. Air, nitrogen, steam, water and pigs are all equally effective alternatives to fuel gases.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This code change proposal will not increase the cost of construction.

FG19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.18-FG-STRAUSBAUGH.PMGCAC

FG20 – 12
409.1.4 (New)

Proponent: Andrew Scott Jones, President, A Better Deal Heating and Air Conditioning, Inc, representing self tfkolter@gmail.com/tom.kolter@yahoo.com

Add new text as follows:

409.1.4 Leak monitor. For newly installed piping systems, a device or system shall be installed that will monitor for water or gas leaks and provide automatic shut off of the water or gas supply.

Reason: Flood damage in buildings resulting from undetected and uncontrolled water leaks is substantial and can be largely eliminated with an automatic supply shut-off valve and leak detection system. Likewise, an uncontrolled gas leaks present a danger to life, and can be largely eliminated if residential properties were protected with an automatic shut off valve and leak detection system.

Many such systems are available on the market at varying costs with a variety of leak detection and shut-off designs. This proposal is limited to new construction and to total refit of plumbing and gas systems, not repairs.

Cost impact: This code change will increase the cost of construction.

FG20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

409.1.4 (NEW)-FG-JONES

FG21 – 12
409.5

Proponent: Jean Steckler, representing TECO Americas (jeans@aa-fs.com)

Revise as follows:

409.5 Appliance shutoff valve. Each *appliance s*hall be provided with a shutoff valve in accordance with Section 409.5.1, 409.5.2 or 409.5.3. <u>Each gas appliance shall be equipped with a passive thermal shut-off device that will automatically stop the flow of gas to the appliance in the event of a fire. The thermal gas shut-off device shall not be a substitute for the manual shut-off valve required by this section. A combination type valve that serves as both a shutoff valve and a thermal shutoff device satisfies the requirements of this section. The thermal shut-off device shall not require electricity or batteries to stop the flow of gas.</u>

Reason: According to the National Fire Protection Association (NFPA), U.S. fire departments face 2,110 home fires each year where natural gas is the first material ignited, and 1,170 home fires a year where LP-gas is involved with the start of a fire. Most home gas fires originate in the kitchen at the stove or gas range.

Building occupants have a false sense of security regarding gas appliances. Occupants assume they have the protection of automatic thermal gas shut-offs, when in reality the manual valves have to be physically shut off to prevent gas release. An automatic thermal shut-off provides passive gas and fire safety, and does not depend on a facility manager to locate and manipulate a manual valve. Automatic thermal gas shutoffs stop the gas from feeding the fire during the time it takes for first responders to reach the facility.

When manual gas shut-off valves are combined with passive, automatic thermal shut-offs, occupants and first responders greatly reduce risk to their lives. And they are much better protected from personal harm and property damage. Automatic thermal gas shutoffs greatly reduce the amount of gas released to the atmosphere when fire occurs. Uncontrolled gas leaks pose a significant hazard to firefighters, emergency responders, and the public.

According to the National Fire Incident Reporting System (NFIRS) database, a system established by the National Fire Data Center of the United States Fire Administration (USFA) to document and develop uniform data reporting when gathering and analyzing information on fires across the U.S., there have been 36,577 fires in the 49 states and the District of Columbia where gas was the material first ignited resulting in an uncontrolled or self-perpetuating fire in the five year period between 2005-2009. Automatic thermal gas shutoffs mitigate consequences of fires:

- Thermal gas shutoffs stop the flow of gas instantaneously when the fire temperature reaches 212°F
- When the curb valve is too close to a burning building to be safely operated, or it is non-existent or inoperable
- Thermal gas shutoffs are intended to shutoff the flow of gas when fire occurs near the gas line
- Automatic thermal gas shutoffs assist in the prevention of risk to fire personnel and first responders when gas is released and acts as an accelerant

The primary incident consequences that would be reduced are deaths, injuries, and property damage. Additional benefits would be an expected reduction in the severity of fires, explosions, and evacuation occurring at incidents, and the quantity of gas lost during incidents.

Cost Impact: Minimal Cost Impact.

FG21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

409.5-FG-STECKLER

FG22 – 12
409.5.3

Proponent: Brent Ursenbach, Salt Lake County, representing Utah Chapter ICC (bursenbach@slco.org)

Revise as follows:

409.5.3 Located at manifold. Where the *appliance* shutoff valve is installed at a manifold, such shutoff valve shall be located within 50' (15240mm) of the *appliance* served, shall be located on the same building level as the *appliance* and shall be readily accessible and permanently identified. The *piping* from the manifold to within 6 feet (1829 mm) of the *appliance* shall be designed, sized and installed in accordance with 401 through 408.

Reason: It is common to have a gas manifold located in a basement level furnace room or mechanical room, with gas appliances located on other levels within a building. It is poses a safety hazard to not have a gas shutoff reasonable close to the gas appliance. Installing and servicing technicians performing start-up and testing procedures on gas appliances may need to turn the gas on and off multiple times as they test inlet and outlet (manifold) pressures. It creates a hazardous condition to not have a means to immediately stop the gas flow while performing service on a gas appliance.

Cost Impact: The code change proposal will not increase the cost of construction

FG22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

409.5.3-FG-URSENBACH

FG23 – 12
410.2

Proponent: Shawn Strausbaugh, Arlington County, VA, representing PMG CAC

Revise as follows:

410.2 MP regulators. MP pressure regulators shall comply with the following:

1. The MP regulator shall be approved and shall be suitable for the inlet and outlet gas pressures for the application.
2. The MP regulator shall maintain a reduced outlet pressure under lockup (no-flow) conditions.
3. The capacity of the MP regulator, determined by published ratings of its manufacturer, shall be adequate to supply the appliances served.
4. The MP pressure regulator shall be provided with access. Where located indoors, the regulator shall be vented to the outdoors or shall be equipped with a leaklimiting device, in either case complying with Section 410.3.
5. A tee fitting with one opening capped or plugged shall be installed between the MP regulator and its upstream shutoff valve. Such tee fitting shall be positioned to allow connection of a pressure-measuring instrument and to serve as a sediment trap.
6. A tee fitting with one opening capped or plugged shall be installed not less than 10 pipe diameters downstream of the MP regulator outlet. Such tee fitting shall be positioned to allow connection of a pressure-measuring instrument.
7. <u>Where connected to rigid piping, a union shall be installed within 1 foot of either side of the MP regulator.</u>

Reason: Section 410.2 needs an item # 7 to require a union upstream of the regulator to allow it to be removed/replaced. Currently, a regulator could be piped inline with rigid steel piping with no way to remove it or isolate it for pressure testing without disassembling a lot of piping upstream or downstream of the regulator. The union can be on either side of a regulator because it is there only to allow the regulator to be removed or isolated for piping testing purposes. Section 409.4 requires a shutoff valve ahead of the regulator.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This code change proposal will increase the cost of construction.

FG23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.2-FG-STRAUSBAUGH.PMGCAC

FG24 – 12
411.1, 411.1.1, 411.1.4

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

411.1 Connecting appliances. Except as required by Section 411.1.1, appliances shall be connected to the piping system by one of the following:

1. Rigid metallic pipe and fittings.
2. Corrugated stainless steel tubing (CSST) where installed in accordance with the manufacturer's instructions.
3. Semirigid metallic tubing and metallic fittings. Lengths shall not exceed 6 feet (1829 mm) and shall be located entirely in the same room as the appliance. Semirigid metallic tubing shall not enter a motor-operated appliance through an unprotected knockout opening.
4. Listed and labeled appliance connectors in compliance with ANSI Z21.24 and installed in accordance with the manufacturer's instructions and located entirely in the same room as the appliance.
5. Listed and labeled quick-disconnect devices used in conjunction with listed and labeled appliance connectors.
6. Listed and labeled convenience outlets used in conjunction with listed and labeled appliance connectors.
7. Listed and labeled outdoor appliance connectors in compliance with ANSI Z21.75/CSA 6.27 and installed in accordance with the manufacturer's instructions.
8. Listed outdoor gas hose connectors in compliance with ANSI Z21.54 used to connect portable outdoor appliances. The gas hose connection shall be made only in the outdoor area where the appliance is to be used, and shall be to the gas piping supply at an appliance shutoff valve, a listed quick-disconnect device, or listed gas convenience outlet.

411.1.1 Commercial cooking appliances. Commercial cooking appliances installed on casters and appliances that are moved for cleaning and sanitation purposes shall be connected to the piping system with an appliance connector listed as complying with ANSI Z21.69 ~~or in accordance with Item 1 or 3 of Section 411.1~~. The commercial cooking appliance connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances with casters shall be limited by a restraining device installed in accordance with the connector and appliance manufacturer's instructions.

~~**411.1.4 Movable appliances.** Where appliances are equipped with casters or are otherwise subject to periodic movement or relocation for purposes such as routine cleaning and maintenance, such appliances shall be connected to the supply system piping by means of an approved flexible connector designed and labeled for the application. Such flexible connectors shall be installed and protected against physical damage in accordance with the manufacturer's installation instructions.~~

Reason: The proposal accomplishes three changes:
1. 411.1 - Add a requirement that a Z21.54 listed connector be used to connect portable outdoor appliances to the house piping system. Z21.54 connectors are designed for such application.
2. 411.1.1 - Requires the use of a Z21.69 listed connector for all commercial cooking appliances on casters and for appliances that are moved for cleaning purposes. This would change eliminate the use of rigid pipe and semirigid metallic tubing. Z21.69 connectors are designed specifically for such application. The change also adds requirements for the proper installation of the connector and requires the installation of a restraining device to project the connector.
3. 411.1.4 – The requirements in this section are covered by the proposed changes to 411.1.1 and the section is no longer needed.

These revisions are consistent with changes adopted into the 2012 National Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

FG24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

411.1-FG-RANFONE

FG25 – 12
411.1.1

Proponent: Shawn Strausbaugh, Arlington County, VA, representing VA Plumbing and Mechanical Inspectors Association (VPMIA) and VA Building Code Officials Association (VBCOA)

Revise as follows:

411.1.1 Commercial cooking appliances. Commercial cooking appliances installed on casters ~~and appliances that are moved for cleaning and sanitation purposes~~ shall be connected to the piping system with an appliance connector listed as complying with ANSI Z21.69. ~~or in accordance with Item 1 or 3 of Section 411.1.~~

Reason: It's not advantageous to have line staff disconnecting and connecting unions and fittings or bending pipe in an effort to reconnect piping so as to be able to clean behind appliances on wheels. This is an unsafe practice. Simply requiring ANSI approved connectors is a much safer practice thereby preventing gas leaks.

When an appliance is manufactured on wheels or casters, it is for the sole purpose to enable movement usually to permit cleaning of the surfaces in the space it normally occupies. It is not reasonable to expect kitchen or cleaning staff to take apart unions or disconnect piping systems to perform daily routine cleaning. The proposal incorporates the ANSI standard which requires several things. First it will require a standoff restraint that is less distance than the connector. Then it requires a connector that is flexible in design and construction. Lastly the connecter will have a "quick-connect" adapter that allows even the most untrained personal to easily remove the line. The line must be reconnected properly or gas will not flow through the line.

Cost Impact: None.

FG25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

411.1.1-FG-STRAUSBAUGH

FG26 – 12
411.1.1

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

411.1.1 Commercial cooking appliances. Commercial cooking appliances installed on casters and appliances that are moved for cleaning and sanitation purposes shall be connected to the piping system with an appliance connector listed as complying with ANSI Z21.69 ~~or in accordance with Item 1 or 3 of Section 411.1~~

Reason; It's not practical for line staff or others to remove pipe and fitting in order to move appliances for cleaning and servicing. This practice could become problematic and when not reconnected correctly could result in gas leaks. Only permitting a listed flex connector is a much safer practice.

Cost Impact: None

FG26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

411.1.1-FG-MCMANN

FG27 – 12
411.1.1, 411.1.4

Proponent: Shawn Strausbaugh, Arlington County, VA, representing PMG CAC

Revise as follows:

~~**411.1.1 Commercial cooking appliances.** Commercial cooking appliances installed on casters and appliances that are moved for cleaning and sanitation purposes shall be connected to the piping system with an appliance connector listed as complying with ANSI Z21.69 or in accordance with Item 1 or 3 of Section 411.1.~~

411.1.4 Movable appliances. Where appliances are equipped with casters or are otherwise subject to periodic movement or relocation for purposes such as routine cleaning and maintenance, such appliances shall be connected to the supply system piping by means of an ~~approved flexible connector designed and labeled for the application~~ appliance connector listed as complying with ANSI Z21.69 or by means of item 1 of section 411.1. Such ~~flexible~~ connectors shall be installed and protected against physical damage in accordance with the manufacturer's installation instructions.

Reason: In Section 411.1.1, does it make sense to permit appliances on casters and appliances that are routinely moved to be connected with metallic tubing? Soft copper tubing, for example, would be work-hardened and damaged as the result of repeated movement and bending. If a deep fryer is on wheels and pulled out for cleaning once per month, who is going to disconnect and reconnect tubing fittings, test for leaks, etc ? Section 411.1.1 is redundant and not needed because section 411.1.4 already covers all movable appliances, including cooking appliances. There is no logical reason to treat cooking appliances differently than any other appliance that is on wheels or is moved for cleaning, servicing or maintenance. The same quality connection should apply for all such appliances. Specifying ANSI Z21.69 is preferable to just requiring the connector to be approved by the code official and labeled for the application. Most connector listings will not prohibit the connector from being used with a moveable appliance, therefore, other connectors that are not as robust as a Z21.69 connector could end up being used, even though they may not be suitable for such harsh duty. If an appliance is periodically moved, a special connector or rigid pipe connections should be used.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This code change proposal will not increase the cost of construction.

FG27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

411.1.1-FG-STRAUSBAUGH.PMGCAC

FG28 – 12
502.1

Proponent: Larry Gill, P.Eng. IPEX USA LLC (larry.gill@ipexna.com)

Revise as follows:

502.1 General. All vents, except as provided in Section 503.7, shall be *listed* and *labeled*. Type B and BW vents shall be tested in accordance with UL 441. Type L vents shall be tested in accordance with UL 641. Vents for Category II, ~~and~~ III and IV appliances shall be tested in accordance with UL 1738. ~~Plastic vents for Category IV appliances shall not be required to be *listed* and *labeled* where such vents are as specified by the *appliance* manufacturer and are installed in accordance with the *appliance* manufacturer's installation instructions.~~

Reason: UL 1738 is the Standard for Safety for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV and should be referenced in the IFGC for all venting materials included in scope of the standard. The current exception not requiring plastic venting to be listed and labelled should be removed as recent changes to UL 1738 now allow PVC and CPVC venting to be tested and listed to the 1738 standard. Further, appliance standards do not adequately address venting and only list plumbing DWV products. Plumbing products are not adequate for venting of appliances. UL 1738 is a system standard and does not permit the mixing of different pipe, fittings or joining methods from different manufacturers. This along with a listed and labelled system specifically designed for appliance venting will provide for a safer environment.

Cost Impact: The proposed change may increase the cost of construction depending on the cost of a listed and labeled venting system.

FG28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

502.1-FG-GILL

FG29 – 12
502.7.1 (New)

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Add new text as follows:

502.7.1 Door swing. Appliance and equipment vent terminals shall be located such that doors cannot swing within 12 inches (305 mm) horizontally of the vent terminal. Door stops or closures shall not be installed to obtain this clearance.

Reason: As indicated in the photo, any gas vent can be subject to damage as a result of a door swing even when the vent has been installed in accordance with the manufacturer's instructions. Most manufacturers do not address proximity to doors on a different plane. Even if the door doesn't come in contact with the vent terminal, the door could be too close to the vent when the appliance is operating and possibly overheating the door causing problems.

Cost Impact: None

FG29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

502.7.1 (NEW)-FG-MCMANN

FG30 – 12
503.8

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

503.8 Venting system termination location. The location of venting system terminations shall comply with the following (see Appendix C):

1. A mechanical draft venting system shall terminate at least 3 feet (914 mm) above any forced-air inlet located within 10 feet (3048 mm).

   Exceptions:

   1. This provision shall not apply to the combustion air intake of a direct-vent appliance.
   2. This provision shall not apply to the separation of the integral outdoor air inlet and flue gas discharge of listed outdoor appliances.

2. A mechanical draft venting system, excluding directvent appliances, shall terminate at least 4 feet (1219 mm) below, 4 feet (1219 mm) horizontally from, or 1 foot (305 mm) above any door, operable window or gravity air inlet into any building. The bottom of the vent terminal shall be located at least 12 inches (305 mm) above finished ground level.
3. The vent terminal of a direct-vent appliance with an input of 10,000 Btu per hour (3 kW) or less shall be located at least 6 inches (152 mm) from any air opening into a building, and such an appliance with an input over 10,000 Btu per hour (3 kW) but not over 50,000 Btu per hour (14.7 kW) shall be installed with a 9-inch (230 mm) vent termination clearance, and an appliance with an input over 50,000 Btu/h (14.7 kW) shall have at least a 12-inch (305 mm) vent termination clearance.The bottom of the vent terminal and the air intake shall be located at least 12 inches (305 mm) above finished ground level.
4. Through-the-wall vents for Category II and IV appliances and noncategorized condensing appliances shall not terminate over public walkways or over an area where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves or other equipment. Where local experience indicates that condensate is a problem with Category I and III appliances, this provision shall also apply. Drains for condensate shall be installed in accordance with the appliance and vent manufacturers' instructions.
5. Vent systems for Category IV appliances that terminate through an outside wall of a building and discharge flue gases perpendicular to the adjacent wall shall be located not less than 10 ft (3 m) horizontally from an operable opening in an adjacent building. This requirement shall not apply to vent terminals that are 2 ft (0.6 m) or more above or 25 ft (7.6 m) or more below operable openings.

Reason: New Extract from the 2012 National Fuel Gas Code. The new coverage adds clearance provisions for category IV appliance side wall vent terminations to adjacent building openings. The National Fire Protection Foundation and the American Gas Association funded a computer modeling study to gauge the extent of ice buildup on adjacent properties from the exhaust of category IV appliances. While the modeling was limited in scope (number of appliances & Btu inputs, location of vent termination and clearance distances), the 10 ft clearance did show that ice buildup would be minimized. The new provision is being provided to the ICC for consideration as an extract for the IFGC.

Cost Impact: The code change proposal will not increase the cost of construction.

FG30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

503.8-FG-RANFONE

FG31 – 12
505.1.1

Proponent: Shawn Strausbaugh, Arlington County, VA, representing PMG CAC

Revise as follows:

505.1.1 Commercial cooking appliances vented by exhaust hoods. Where commercial cooking appliances are vented by means of the Type I or II kitchen exhaust hood system that serves such appliances, the exhaust system shall be fan powered and the appliances shall be interlocked with the exhaust hood system to prevent appliance operation when the exhaust hood system is not operating. The method of interlock between the exhaust hood system and the appliances equipped with standing pilot burner ignition systems shall not cause such pilots to be extinguished. Where a solenoid valve is installed in the gas piping as part of an interlock system, gas piping shall not be installed to bypass such valve. Dampers shall not be installed in the exhaust system.

> **Exception:** An interlock between the cooking appliance(s) and the exhaust hood system shall not be required where heat sensors or other approved methods automatically activate the exhaust hood system when cooking ~~operations occur~~ appliances are operating.

Reason: What about when the appliances are firing to be ready to cook, but no cooking is occurring? The hood system is typically the venting means for the products of combustion generated by the gas-fired appliances. The intent of the code is to make certain that the exhaust system is operating any time that the appliances are firing and this is not necessarily related to when actual cooking is taking place.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This code change proposal will not increase the cost of construction.

FG31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.1.1-FG-STRAUSBAUGH.PMGCAC

FG32 – 12
505.1.1

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

505.1.1 Commercial cooking appliances vented by exhaust hoods. Where commercial cooking appliances are vented by means of the Type I or II kitchen exhaust hood system that serves such appliances, the exhaust system shall be fan powered and the appliances shall be interlocked with the exhaust hood system to prevent appliance operation when the exhaust hood system is not operating. The method of interlock between the exhaust hood system and the appliances equipped with standing pilot burner ignition systems shall not cause such pilots to be extinguished. Where a solenoid valve is installed in the gas piping as part of an interlock system, gas piping shall not be installed to bypass the <u>solenoid</u> valve <u>and the circuitry for the interlock system shall be arranged to require a manual reset operation so that after power has been interrupted to the valve the valve will not automatically re-open upon restoration of the power supply</u>. ~~Dampers shall not be installed in the exhaust system~~.

> **Exception:** An interlock between the cooking appliance(s) and the exhaust hood system shall not be required where heat sensors or other approved methods automatically activate the exhaust hood system when cooking operations occur

Reason: A realistic scenario exists where in the event of a power failure during normal cooking operations the line stall could walk away from the stove or cook top and not shut off the valves. When the power comes back on gas could flow freely creating a potential disaster. In fact, any time that the hood is powered off for any reason, the kitchen staff could walk away from the appliances without turning off the burners and when the hood is powered again, the appliances could be unattended. Installing a manual reset device will ensure that this could not happen. The last sentence has been stricken as this is an IMC issue and isn't related to the IFGC.

Cost Impact: This may increase cost

FG32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.1.1-FG-MCMANN

FG33 – 12
618.4, 618.5, 618.6, 309 (New), 310 (New)

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

~~**618.4 Prohibited sources.** Outdoor or return air for forcedair heating and cooling systems shall not be taken from the following locations:~~

1. ~~Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.~~
2. ~~Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm)above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.~~
3. ~~A hazardous or insanitary location or a refrigeration machinery room as defined in the International Mechanical Code.~~
4. ~~A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Section 618.2, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.~~

   ~~**Exception:** The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.~~

5. ~~A room or space containing an appliance where such a room or space serves as the sole source of return air.~~

   ~~**Exception:** This shall not apply where:~~

   1. ~~The appliance is a direct-vent appliance or an appliance not requiring a vent in accordance with Section 501.8.~~
   2. ~~The room or space complies with the following requirements:~~
      - ~~2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6L/W) of combined input rating of all fuel-burning appliances therein.~~
      - ~~2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.~~
      - ~~2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner appliance in the same room or space.~~
   3. ~~Rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.~~
6. ~~A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.~~

   ~~**Exceptions:**~~

   1. ~~Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances and serve only the kitchen area, taking return air from a kitchen area shall not be prohibited.~~
   2. ~~Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.~~

7. ~~A crawl space by means of direct connection to the return side of a forced-air system. Transfer openings in the crawl space enclosure shall not be prohibited.~~

618.5 Return air and outdoor openings. Return air openings shall be located and installed in accordance with Section 309. Outdoor air openings shall be located and installed in accordance with Section 310.

~~**618.5 Screen.** Required outdoor air inlets for residential portions of a building shall be covered with a screen having 1/4-inch (6.4 mm) openings. Required outdoor air inlets serving a nonresidential portion of a building shall be covered with screen having openings larger than 1/4 inch (6.4 mm) and not larger than 1 inch (25 mm).~~

~~**618.6 Return-air limitation.** Return air from one dwelling unit shall not be discharged into another dwelling unit .~~

Add new text as follows:

SECTION 309
RETURN AIR

309.1 Return air openings. Return air openings for heating, ventilation and air conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet measured in any direction from an open combustion chamber or draft hood of another appliance located in the same room or space.
2. Return air shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the appliance or equipment manufacturers' installation instructions, Manual D or the design of the *registered design professional*.
5. Return air shall not be taken from a closet, bathroom, toilet room, kitchen garage, mechanical room, boiler room, furnace room or unconditioned attic.

   Exceptions:

   1. Where return air is taken from a kitchen and such return air serves the kitchen only, openings shall be located not less than 10 feet from the cooking appliances.
   2. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage

6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air from one dwelling unit shall not be discharged into or taken from another dwelling unit.

310
INTAKE OPENINGS.

310.1 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located a minimum of 10 feet (3048 mm) from lot lines or buildings on the same lot.

2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.2.1. Outdoor intake openings shall be permitted to be located less than 10 feet horizontally from streets, alleys, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front a street or public way, the distance shall be measured from the closest edge of the street or public way.
3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening.
4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the *International Building Code.*

310.2 Intake opening protection. Air intake openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles. Openings in louvers, grilles and screens shall be sized in accordance with Table 310.2, and shall be protected against local weather conditions. Louvers that protect air intake openings in structures located in hurricane-prone regions, as defined in the *International Building Code*, shall comply with AMCA 550. Outdoor air intake openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the International Building Code.

TABLE 310.2
OPENING SIZES IN LOUVERS, GRILLES AND SCREENS PROTECTING AIR INTAKE OPENINGS

OUTDOOR OPENING TYPE	**MINIMUM AND MAXIMUM OPENING SIZES IN LOUVERS, GRILLES AND SCREENS MEASURED IN ANY DIRECTION**
Intake openings in residential occupancies	Not < 1/4 inch and not > 1/2 Inch
Intake openings in other than residential occupancies	> 1/4 inch and not > 1 inch

For SI:1 inch =25.4mm.

(Renumber subsequent sections)

Reason: This is an attempt to reorganize and delete language in this section that contains outdated legacy code language. Also, this proposal separates outside and return air openings into two distinct categories and places them in a neutral place. These requirements apply to more than just furnaces. This section is much more complicated than it needs to be as the foremost concern regarding return air is to keep contaminants out of the openings and air stream. This section is long over-due for an overhaul, the intent in which is to simplify the matter.

- This section is being relocated to more central location as the subject matter applies to more than just furnaces; it applies to air conditioning and ventilation systems as well. A simple reference to this new Section is all that will be required. Outdoor air intake openings now have their own section as well.

- Existing item 1 and 2 dealt primarily with outdoor opening which can be referenced in the new 310.2.

- Existing text in item 3 remains in its new location.

- Existing text in item 4 will literally prevent a return air opening in most bedrooms as they are usually less than 25% of the area served. There is no technical justification for this benchmark. What significance would there be between 25% and 26% that will impact the return air system? There is no need for such an arbitrary benchmark. What's really important is not to take too much air out of a room as noted in the new #3.

- The size of any transfer should be according to design, not arbitrary, outdated numbers as in the existing #4

- Item 5 has many problems and has been deleted in its entirety. It's a tortured approach as it attempts to describe a furnace in an enclosure with no return air duct along side a water heater all the while using the enclosure as a plenum utilizing louvered doors or openings to bring air back to the unit. This is not current practice and is prohibited. It calls for volume which is twice as much as current combustion requirements and is very difficult to explain the picture it attempts to deliver.

- Existing text in item 6 and 7 remain in the new location.

Section 618.7 has been incorporated into the new location as #7.
All the usual requirements that can affect the quality and installation of return air openings are contained in this new location and in turn, simplifies the subject matter for the user. There are no new requirements.

Cost Impact: None

FG33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

618.5 #1-FG-MCMANN

FG34 – 12
618.4, 618.4 (New)

Proponent: Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

~~**618.4 Prohibited sources.** Outdoor or return air for forcedair heating and cooling systems shall not be taken from the following locations:~~

1. ~~Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.~~
2. ~~Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm)above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.~~
3. ~~A hazardous or insanitary location or a refrigeration machinery room as defined in the International Mechanical Code.~~
4. ~~A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Section 618.2, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.~~

   ~~**Exception:** The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.~~

5. ~~A room or space containing an appliance where such a room or space serves as the sole source of return air.~~

   ~~**Exception:** This shall not apply where:~~

   1. ~~The appliance is a direct-vent appliance or an appliance not requiring a vent in accordance with Section 501.8.~~
   2. ~~The room or space complies with the following requirements:~~
      - ~~2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6L/W) of combined input rating of all fuel-burning appliances therein.~~
      - ~~2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.~~
      - ~~2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner appliance in the same room or space.~~
   3. ~~Rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.~~
6. ~~A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.~~

   ~~**Exceptions:**~~

   1. ~~Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances and serve only the kitchen area, taking return air from a kitchen area shall not be prohibited.~~
   2. ~~Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.~~

~~7. A crawl space by means of direct connection to the return side of a forced-air system. Transfer openings in the crawl space enclosure shall not be prohibited.~~

618.4 Supply, Return and outdoor air. Supply, return and outdoor air installations shall be installed in accordance with the *International Mechanical Code.*

Reason: The purview of the Fuel Gas Code presides over the gas fired appliance. How the appliance is ducted and all that surrounds it should be up to the other codes. The Fuel Gas code doesn't attempt to tell the user how to electrically wire it, so why should it tell the user how to duct it.

Cost Impact: None

FG34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

618.5 #2-FG-MCMANN

FG35 – 12
618.4, 618.5 (New), 618.6 (New)

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Delete and substitute as follows:

~~**618.4 Prohibited sources.** Outdoor or return air for forcedair heating and cooling systems shall not be taken from the following locations:~~

1. ~~Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.~~
2. ~~Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm)above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.~~
3. ~~A hazardous or insanitary location or a refrigeration machinery room as defined in the International Mechanical Code.~~
4. ~~A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Section 618.2, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.~~

   ~~**Exception:** The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.~~

5. ~~A room or space containing an appliance where such a room or space serves as the sole source of return air.~~

   ~~**Exception:** This shall not apply where:~~

   1. ~~The appliance is a direct-vent appliance or an appliance not requiring a vent in accordance with Section 501.8.~~
   2. ~~The room or space complies with the following requirements:~~
      - ~~2.1.~~ ~~The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6L/W) of combined input rating of all fuel-burning appliances therein.~~
      - ~~2.2.~~ ~~The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.~~
      - ~~2.3.~~ ~~Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner appliance in the same room or space.~~
   3. ~~Rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.~~
6. ~~A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.~~

   ~~**Exceptions:**~~

   1. ~~Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances and serve only the kitchen area, taking return air from a kitchen area shall not be prohibited.~~
   2. ~~Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.~~

7. ~~A crawl space by means of direct connection to the return side of a forced-air system. Transfer openings in the crawl space enclosure shall not be prohibited.~~

618.5 Outdoor air openings: Outdoor air intake openings for a forced-air heating system shall be located in accordance with all of the following:

1. Outdoor air openings located within 10 feet horizontally of an appliance vent outlet, a plumbing vent outlet, or an exhaust fan discharge outletshall be not less than 3 feet below such outlets.
2. They shall be not less than 10 feet (3048 mm) above the surface of any adjoining sidewalk, street, alley or driveway.
3. They shall be an approved distance from a storage location where the stored materials emit odors, fumes, hazardous or flammable vapors.

618.6 Indoor return air openings: Indoor return air intake openings for a forced-air heating system shall be in accordance with all of the following:

1. Shall be located in rooms or spaces where the supply air rate discharged back into the room or space is equal to or greater than the return air rate taken from the space.
2. Shall be located a minimum of 10 feet (3048 mm) from a cooking appliance or the firebox or draft hood of a natural draft vented fuel-burning appliance.
3. Where located in a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or attic. Return air is permitted to be taken from such spaces where they are served by a dedicated force-air heating system and the supply air rate discharged back into the room or space is equal to or greater than the return air rate taken from the space.
4. Return air intake openings shall not be located in the following locations:
   4.1. Where stored materials emit odors, fumes, hazardous or flammable vapors
   4.2. A refrigeration machinery room as defined in the *International Mechanical Code*

Reason: The proposal seeks to clarify the provisions as follows:
1. Reorganize code requirements by outdoor and indoor air opening locations.
2. State provisions in a positive manner and minimize the use of exceptions.
3. Eliminate unenforceable language or language open to wide interpretation – for example “insanitary location”, “objectionable odors”
4. Simplify the requirements regarding indoor return air openings
5. Allow return air openings a wider variety of spaces where a dedicated forced-air system is installed. Currently coverage only permits kitchen installations.
6. Eliminate the 25% requirement that has no technical basis. The revised text such spaces to be supplied with an equal or greater rate of supply air. (New 618.6 #1)

Cost Impact: The code change proposal will not increase the cost of construction.

FG35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

618.5-FG-RANFONE

FG36 – 12
621.2, 621.4

Proponent: Craig Conner, Building Quality, representing self

Revise as follows:

Revise as follows:

~~**621.2 Prohibited use.** One or more unvented room heaters shall not be used as the sole source of comfort heating in a dwelling unit.~~

621.4 Prohibited locations. Unvented room heaters shall not be installed within occupancies in Groups A, E and I. Unvented room heaters shall not be installed within dwelling units. The location of unvented room heaters shall also comply with Section 303.3.

Reason: Unvented room heaters should not be allowed in the dwelling units of new, tight, energy-efficient buildings. A new study by the Building Research Council at the University of Illinois measured the air quality produced by unvented heaters as used in real residences. The study demonstrated problems with the indoor air quality in residences with unvented heaters. The study also calls into question the extent of the protection provided by one of the industry's key safety devices, the oxygen depletion sensor (ODS).

A study of 30 homes with unvented gas fireplaces was recently published in the Indoor Air journal[1]. The study monitored the combustion products in the residences. Of the greatest concern was the measured nitrogen dioxide levels (NO_2). There are 4 relevant guidelines/standards for NO_2. About 40% of the residences exceeded both the most lenient ANSI Standard Z21.11.2 value of 300 ppb and the Health Canada guideline of 250 ppb. About 80% exceeded both the US National Ambient Air Quality Standards/EPA standard of 100 ppb and the World Health Organization (WHO) guideline of 110 ppb.[2] A whopping 40% were at least triple the US standard. The study concluded

> "*Levels of NO_2 that exceeded health-based guidelines occurred regardless of usage patterns, so should be considered inherent to the fireplace performance."*

Twenty percent of the heaters exceeded the carbon monoxide (CO) safety level, as established by the US National Ambient Air Quality Standards/EPA standard of 100 ppm (8 hour period).

Unvented heater proponents routinely argue that unvented heaters with oxygen depletion sensors (ODS) have never been shown to have significant health or safety issues. The unvented trade association says "*Vent-free appliances feature an automatic safety shut-off device (Oxygen Detection System or ODS). The ODS turns off the gas in case of a malfunction.*" It is perhaps stating the obvious, but an oxygen depletion sensor monitors oxygen, not carbon monoxide or nitrogen dioxide. Clearly the ODS sensor allowed the indoor air quality to exceed safe levels far too often. It is clear that the ODS did not turn of the gas for the 20% of the heaters that exceeded the carbon monoxide (CO) safety level. Worse yet an outright majority of the unvented heaters exceeded the safety levels for NO[2]. (http://www.ventfree.org/images/stories/files/VentFree_SafeEfficient_V06.pdf)

The study monitored the combustion products in the residences for only 3 to 4 days in each of the 30 homes. It only took 3 or 4 days to find the air quality problems reported. Longer monitoring would likely have reported problems with additional residences. Does the industry still conclude there is no evidence of problems?

The 2012 IECC requires residences in most of the US (climates zone 3 to 8) to be tested to show an air leakage of 3 ACH50 or less (IECC R402.4.1.2). The residences in this study were also tested for air tightness, with the tightest being almost twice as leaky as allowed by the new IECC and the average (median) being almost 4 times as leaky as allowed by the new energy code. New commercial buildings also have substantially more stringent air tightness requirements ((IECC C402.4). If anything, the study of the 30 residences underestimates the air quality problems in new dwelling units.

As if to echo these concerns with health and safety here, it is significant that a number of the producers of vented heater products refuse to produce unvented products due to their concerns with health and safety issues (Hearth & Home Technologies, Jotul, Kozy Heat Fireplaces, Mendota Fireplaces, Renni, Travis Industries), including the largest maker of fireplaces and hearth products.

Unvented gas room heaters do not belong in dwelling units.

1. "Measured concentrations of combustion gases from the use of unvented gas fireplaces". Francisco, P. W., Gordon, J. R. and Rose, B. (2010), Indoor Air, volume 20: pages 370–379.
2. NO_2 measurements are average over one hour.
3. http://www.ventfree.org/images/stories/files/VentFree_SafeEfficient_V06.pdf

Cost Impact: This code change proposal will increase the cost of construction.

FG36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

621.2-FG-CONNER

FG37 – 12
623.2

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

623.2 Prohibited location. Cooking appliances designed, tested, *listed and labeled for use in commercial occupancies* shall not be installed within dwelling units or within any area where domestic cooking operations occur.

<u>**Exception:** Appliances that are also listed as domestic cooking appliances.</u>

Reason: There are cooking appliances that carry dual listings, meeting the requirements of both the commercial and residential ANSI cooking standards. Section 623.2 currently prohibits such appliances from being installed in dwelling units. The exception is meant to allow dual listed appliances to be installed in dwelling units that are listed to the Z21.58 (residential) and Z83.11 (commercial) standards.

Cost Impact: The code change proposal will not increase the cost of construction.

FG37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

623.2-FG-RANFONE

FG38 – 12

635.2 (New), 635.2.2 (New), 635.3 (New), Chapter 8; IMC: 926.2 (New), 926.2.1 (New), 926.2.2 (New), 926.3 (New)

Proponent: Robert J Davidson, Code Consultant, Davidson Code Concepts, LLC (rjd@davidsoncodeconcepts.com); Robert Boyd, Chair – Hydrogen Industry Panel on Codes (HIPOC)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IFGC COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I - IFGC

Add new text as follows:

SECTION 635 (IFGC)
GASEOUS HYDROGEN SYSTEMS

635.2 Hydrogen generation. Hydrogen generators shall be tested and listed or shall be approved. Hydrogen generators shall be installed in accordance with the manufacturer's instructions, the International Building Code and the International Fire Code.

635.2.1 Water electrolysis process. Hydrogen generators utilizing the water electrolysis process shall be tested and listed in accordance with ISO 22734-1 or ISO 22734-2.

635.2.2 Fuel processing technologies. Hydrogen generators utilizing fuel processing technologies with a capacity of less than 400 m3/h at 0 °C and 101,325 kPa, shall be tested and listed in accordance with ISO 16110-1.

635.3 Generators with integral storage. Hydrogen generators with integral storage shall be located in accordance with the International Fire Code.

Add new standards to Chapter 8 as follows:

ISO 22734-1:2008 Hydrogen generators using water electrolysis process -- Part 1: Industrial and commercial applications

ISO 22734-2:2011 Hydrogen generators using water electrolysis process -- Part 2: Residential applications

ISO 16110-1:2007 Hydrogen generators using fuel processing technologies -- Part 1: Safety

PART II – IMC

Add new text as follows:

SECTION 926
GASEOUS HYDROGEN SYSTEMS

926.1 Installation. The installation of gaseous hydrogen systems shall be in accordance with the applicable requirements of this code, the International Fire Code, the International Fuel Gas Code and the International Building Code.

926.2 Hydrogen generation. Hydrogen generators shall be tested and listed or shall be approved Hydrogen generators shall be installed in accordance with the manufacturer's instructions, the International Building Code, the International Fuel Gas Code and the International Fire Code.

926.2.1 Water electrolysis process. Hydrogen generators utilizing the water electrolysis process shall be tested and listed in accordance with ISO 22734-1 or ISO 22734-2.

926.2.2 Fuel processing technologies. Hydrogen generators utilizing fuel processing technologies with a capacity of less than 400 m3/h at 0 °C and 101,325 kPa, shall be tested and listed in accordance with ISO 16110-1.

926.3 Generators with integral storage. Hydrogen generators with integral storage shall be located in accordance with the International Fire Code.

Add new standards to Chapter 15 as follows:

ISO 22734-1:2008 Hydrogen generators using water electrolysis process -- Part 1: Industrial and commercial applications

ISO 22734-2:2011 Hydrogen generators using water electrolysis process -- Part 2: Residential applications

ISO 16110-1:2007 Hydrogen generators using fuel processing technologies -- Part 1: Safety

Reason: The purpose of this code change is to correct an unintended consequence that came about as the I-Codes have been added to and modified to provide for the safe use of hydrogen as a fuel gas for fuel cells in both stationary and mobile applications.

Hydrogen generators without integral storage of the hydrogen gas have long been in use in industrial and laboratory settings for the production of hydrogen gas as a fuel gas. They can be safely used in indoor or outdoor applications in accordance with manufacturer's instructions and relevant codes and standards. In many situations a hydrogen gas generator is a safer option than stored cylinders of compressed hydrogen. When a generator is shut down you stop generating hydrogen, the hydrogen gas that may remain is what is in the closed fuel gas supply piping. Whereas a cylinder of compressed hydrogen gas will continue to contain whatever amount of gas remains in a compressed state, maintaining the possibility of a release beyond what is in the fuel gas piping.

With the crafting of new language for the safe use of various applications involving hydrogen as a fuel gas the codes and standards have developed and applied distance to exposure requirements for installations involving the storage of hydrogen gas. The distance tables are built around the hazard presented by the amount of hydrogen stored and the conditions of storage. Those distances were not intended to apply to the hydrogen generators that do not have integral storage of the hydrogen produced. Unfortunately code officials have occasionally, and incorrectly, applied the new location and distance requirements against hydrogen generators without integral storage.

What this proposal does is add language to both the IFGC and the IMC specific to hydrogen generators requiring that they be tested and listed or approved. It provides three new referenced standards for two common types of hydrogen generators and it clarifies that only those hydrogen generators with integral storage of the hydrogen gas produced are to be located as required by the International Fire Code.

Cost Impact: The code change proposal will not increase the cost of construction; it will reduce costs by eliminating the unintended application of new site distance requirements to hydrogen generators.

Analysis: A review of the standard proposed for inclusion in the code, ISO 22734-1, ISO 22734-2, and ISO 16110-1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FG38-12
PART I - INTERNATIONAL FUEL GAS CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II - INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

635.2 (NEW)-FG-DAVIDSON

FG39– 12
704.1.2, 704.1.2.4, 705.2, 705.3, Chapter 8

Proponent: Robert J Davidson, Code Consultant, Davidson Code Concepts, LLC (rjd@davidsoncodeconcepts.com); Robert Boyd, Chair – Hydrogen Industry Panel on Codes (HIPOC)

Revise as follows:

704.1.2 Piping systems. Piping, tubing, valves and fittings conveying gaseous hydrogen shall be designed and installed in accordance with Sections 704.1.2.1 through 704.1.2.5.1, Chapter 50 of the International Fire Code, and ~~ASME B31.3~~ ASME B31.12. Cast-iron pipe, valves and fittings shall not be used.

704.1.2.4 Joints. Joints in piping and tubing in hydrogen service shall be listed as complying with ASME B31.3 to include the use of welded, brazed, flared, socket, slip and compression fittings. Gaskets and sealants used in hydrogen service shall be listed as complying with ~~ASME B31.3~~ ASME 31.12. Threaded and flanged connections shall not be used in areas other than hydrogen cutoff rooms and outdoors.

705.2 Inspections. Inspections shall consist of a visual examination of the entire piping system installation and a pressure test. Hydrogen piping systems shall be inspected in accordance with this code. Inspection methods such as outlined in ~~ASME B31.3~~ ASME 31.12shall be permitted where specified by the design engineer and approved by the code official. Inspections shall be conducted or verified by the code official prior to system operation.

705.3 Pressure tests. A hydrostatic or pneumatic leak test shall be performed. Testing of hydrogen piping systems shall utilize testing procedures identified in ~~ASME B31.3~~ ASME 31.12 or other approved methods, provided that the testing is performed in accordance with the minimum provisions specified in Sections 705.3.1 through 705.4.1.

Add new standard to Chapter 8 as follows:

ASME B31.12-2008 Hydrogen Piping and Pipelines

Reason: The Hydrogen Industry Panel on Codes and Standards recommends this change from one ASME standard to another. In 2008 ASME published the standard, ASME B31.12 Hydrogen Piping and Pipelines, this standard incorporates all of the hydrogen related content from ASME 31.3 of B31.1, B31.3 and B31.8, thus making a single reference to ASME 31.12 all that is needed. In addition the ASME Hydrogen Piping standard B31.12 provides expanded guidance on material selection, testing and fabrication specific to hydrogen applications. ASME B31.12 is accepted in the emerging hydrogen transport fuel industry as well as the tradtional industrial hydrogen applications used by industriy. This change also harmonizes the IFGC with similar model codes for hydrogen applications and would simplify both regulation and compliance by reducing the quantity of reference documents.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME B31.12 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

FG39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

704.1.2-FG-DAVIDSON

2012 PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

PLUMBING CODE COMMITTEE

Dave Cantrell, *Chair*
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Public Health – Seattle & King County
Seattle, WA

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Supervisor
County of Henrico
Henrico, VA

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Senior Building Construction Engineer
NYS Department of State, Division of Code
Enforcement and Administration
Albany, NY

Paul R. Bladdick, MP
Vice President & Master Plumber
The LPB Co. Inc.
White Lake, MI

David DeBord, CPD, LEED-AP, ARCSA-AP
Rep: American Society of Plumbing Engineers
David E. DeBord
Plumbing and Fire Protection Engineer
Chicago, IL

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Combination Building Inspector
City of McKinney
McKinney, TX

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Association
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C.N. Finley
New Orleans, LA

Robert G. Konyndyk
Chief, Plumbing Division, Bureau of
Construction Codes, Dept. of Licensing and
Regulatory Affairs
Lansing, MI

Paul Michelsohn, Jr.
Rep: National Association of Home Builders
President
Michelsohn & Daughter Const. Inc.
Anchorage, AK

Louis P. Pody
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Inspectors Association
Business Representative
Plumbers Local 75
Beloit, WI

John A. Robitaille, CBO
Certified Building and Site Inspector
Wilmington, DE

Carrie Rouleau-Cote
Building Inspector/Code Enforcement Officer
Town of Auburn, New Hampshire
Auburn, NH

Bob Scott, MP
Plumbing Inspector III
State of Colorado Examining Board of
Plumbers
Denver, CO

Len Swatkowski
Technical Director
Plumbing Manufacturers International
Rolling Meadows, IL

Troy D. Vassos, Phd., PE
President & Senior Environmental Engineer
NovaTec Consultants, Inc.
Vancouver, Canada

Staff Secretariat:
Fred Grable, PE
Staff Engineer - Plumbing
International Code Council
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE
INTERNATIONAL PLUMBING/PRIVATE SEWAGE DISPOSAL CODE

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

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

P = *International Plumbing Code*
PSD = *International Private Sewage Disposal Code*

P118-12: NUMBER NOT USED
P151-12: NUMBER NOT USED

P1-12
P2-12
P4-12
P5-12
P6-12
P7-12
P8-12
P9-12
P10-12
P11-12
P12-12
P13-12
P14-12
P15-12
P16-12
P17-12
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P222-12
P223-12
P224-12
P225-12
P226-12
P227-12
P230-12

P1 – 12
202

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

BACKFLOW PREVENTER. A backflow prevention assembly, a backflow prevention device or other means or method to prevent backflow into the potable water supply.

Reason: This definition is used throughout the code. However, it does not define to the user of the code, how to specifically identify or apply proper "protection" to a use or connection. Industry standards differentiate between backflow prevention devices and backflow prevention assemblies. A backflow prevention assembly is a specific type of mechanical backflow prevention protection which is field testable and repairable in-line, with shutoff valves and test cock fittings.

Cost Impact: The code change proposal will not increase the cost of construction.

P1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 BACKFLOW PREVENTER-P-MOSS

P2– 12
202

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

CONTAMINATION. A~~n~~ high hazard or health hazard impairment of the quality of the potable water that creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids or waste.

Reason: The code does not define "high hazard" or health hazard, however, the term is used as a footnote for Table 608.1. This terminology is required to more correctly determine the type of backflow prevention assembly, backflow prevention device, means or method which is required for the protection of the water system to ensure protection of public health.

Cost Impact: The code change proposal will not increase the cost of construction.

P2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 CONTAMINATION-P-MOSS

P3 – 12
202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC STRUCTURAL DEVELOPMENT COMMITTEE.

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov), Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Revise as follows:

[B] DESIGN FLOOD ELEVATION. The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard map. <u>In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building’s* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).</u>

Reason: This definition is controlled by the IBC; this proposal brings the IPC, IMC, IFGC, and IPSDC definitions in line with the term as defined by the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

P3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-P-DESIGN FLOOD ELEVATION-INGARGIOLA-WILSON.doc

P4 – 12
202

Proponent: James Paschal, Paschal Engineering representing himself (Jim@PaschalEngineering.com)

Revise as follows:

MECHANICAL JOINT. A connection between pipes, fittings, or pipes and fittings that is not screwed, caulked, threaded, soldered, solvent cemented, brazed, ~~or~~ welded, or heat-fused. A joint in which compression is applied along the centerline of the pieces being joined. In some applications, the joint is part of a coupling, fitting, or adapter.

Reason: Heat fusion is now a defined type of joint for plastic piping, and is considered separate from welding because there is not any additional filler material used in forming the joint. However, heat-fusion joints are not mechanical joints and as such should be excluded from the definition of mechanical joints.

Cost Impact: None

P4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 MECHANICAL JOINT-P-PASCHAL

P5– 12
202

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan, representing The Bureau of Construction Codes (konyndykr@michigan.gov)

Revise as follows:

PLUMBING SYSTEMS. Includes the water ~~supply and~~ distribution pipes; plumbing fixtures and traps; water-treating or water-using equipment; soil, waste and vent pipes; ~~and sanitary and storm sewers~~ and building drains; in addition to their respective connections, devices and appurtenances within a structure or premises~~.~~; and the water service, building sewer and building storm sewer serving such structure or premises.

Reason: This code change revision will improve the code by providing greater clarity. The code proposal revision will not add or delete any of the current areas identified in the code. It will rearrange the items to enhance the understanding that water supplies, storm sanitary and storm sewers are located outside the structures. They are however identified in the code and remain critical to the operation of structures.

Cost Impact: The revision will not affect construction costs and may reduce construction planning costs.

P5-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 PLUMBING SYSTEMS-P-KONYNDYK

P6 – 12
202

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

POLLUTION. A~~n~~ low hazard or non-health hazard impairment of the quality of the potable water to a degree that does not create a hazard to the public health, but that does adversely and unreasonably affect the aesthetic qualities of such potable water supply for domestic use.

Reason: The code does not define “low hazard” or non-health, however, the term is used in Table 608.1 as a footnote. This terminology is required to more correctly determine the type of backflow prevention assembly, backflow prevention device, means or method which is required for the protection of the water system to ensure protection of public health.

Cost Impact: The code change proposal will not increase the cost of construction.

P6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 POLLUTION-P-MOSS

P7 – 12
202

Proponent: Windell F. Peters, representing the Georgia State Inspectors Association (windellf@bellsouth.net)

Revise as follows:

Public sewer. ~~A common sewer directly controlled by public authority.~~ That part of the drainage system of pipes, installed and maintained by a city, township, county, public utility company or other public entity, and located on public property, in the street or in an approved dedicated easement of public or community use.

Reason: The AHJ requires approval before work can be performed on any utilities under their control. The IPC references public sewer and water main numerous times. The current definition of Public Sewer does not adequately define the term. Water mains and public sewers are controlled by local government and located in an area controlled by them as well. The definition of public sewer should be as detailed as the current definition of water main
for clarity purposes.

Cost Impact: The code change proposal will not increase the cost of construction.

P7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 PUBLIC SEWER-P-PETERS

P8 – 12
202

Proponent: Dana Bres, P.E, U.S. Department of Housing and Urban Development representing the U.S. Department of Housing and Urban Development (dana.b.bres@hud.gov)

Add new definition as follows:

TANKLESS WATER HEATER. A non-storage water heating appliance or equipment that heats potable water on demand and supplies such water to the potable *hot water* distribution system.

Reason: Tankless water heaters are becoming more common in construction. The term is not defined although the term is used in section 501.6 and in proposed changes elsewhere. This definition would not include instantaneous point of use heaters as those systems would not supply hot water to the distribution system of a building.

Cost Impact: The code change proposal will not increase the cost of construction.

P8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 TANKLESS WATER HEATER-P-BRES

P9– 12
202

Proponent: Bob Adkins, Prince William County VA Representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (radkins@pwcgov.org)

Add new definition as follows:

TOILET FACILITY. A room or space that contains not less than one water closet and one lavatory.

Reason: A definition for "toilet facility" is needed. The term is found in the code 27 times but yet the never really provides a clear indication of what is intended in each case its mentioned.

Cost Impact: none

P9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 TOILET FACILITY-P-ADKINS

P10 – 12
202

Proponent: Shawn Strausbaugh, Arlington County VA representing the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Add new definition as follows:

<u>**WASTE RECEPTOR.** A floor sink, standpipe, hub drain or a floor drain that receives the discharge of one or more indirect waste pipes.</u>

Reason: A definition for “waste receptor” is needed. The term is found in the code 24 times with no exact description. Also, see coordinated proposed change in Chapter 8 based on this definition.

Cost Impact: None

P10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202 WASTE RECEPTOR (NEW)-P-STRAUSBAUGH

P11 – 12
202, 301.3, Chapter 13, Chapter 13 (New), Chapter 14 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new definitions as follows:

STORAGE TANK. A fixed container for holding water at atmospheric pressure for subsequent reuse as part of a plumbing or irrigation system.

RECLAIMED WATER. *Non-potable water* that has been derived from the treatment of wastewater by a facility or system licensed or permitted to produce water meeting the jurisdiction's water requirements for its intended uses. Also known as "Recycled Water."

ONSITE NON-POTABLE WATER REUSE SYSTEMS. Water systems for the collection, treatment, storage, distribution, and reuse of non-potable water generated onsite, including but not limited to graywater systems. This definition does not include rainwater harvesting systems.

DISTRIBUTION PIPE. Pressurized or non-pressure piping used within the plumbing system of a building to deliver rainwater or graywater from the *storage tank* or pump to the point of use.

COLLECTION PIPE. Unpressurized pipe used within the collection system that drains onsite non-potable water or rainwater to a storage tank by gravity.

ALTERNATE ON–SITE NON-POTABLE WATER. Non-potable water from other than public utilities, onsite surface sources and subsurface natural freshwater sources. Examples of such water are graywater, on-site reclaimed water, collected rainwater, captured condensate, and rejected water from reverse osmosis systems.

METER. A measuring device used to collect data and indicate water usage.

RAINWATER. Water from natural precipitation.

Revise as follows:

301.3 Connections to drainage system. Plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems required by Chapter 8.

> **Exception:** Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved ~~gray water~~ system in accordance with Chapter 13 and 14 ~~for flushing of water closets and urinals or for subsurface landscape irrigation~~.

Delete existing Chapter 13 and substitute as follows:

~~CHAPTER 13~~
~~GRAY WATER RECYCLING SYSTEMS~~

CHAPTER 13
NON-POTABLE WATER SYSTEMS

SECTION 1301

GENERAL

1301.1 Scope. The provisions of Chapter 13 shall govern the materials, design, construction and installation of systems for the collection, storage, treatment, and distribution of non-potable water. The use and application of non-potable water shall comply with laws, rules and ordinances applicable in the jurisdiction.

1301.2 Water quality. Non-potable water for each end use application shall meet the minimum water quality requirements as established for the intended application by the laws, rules and ordinances applicable in the jurisdiction. Where *non-potable* water from different sources is combined in a system, the system shall comply with the most stringent of the requirements of this code that are applicable to such sources.

1301.2.1 Residual disinfectants. Where chlorine is used for disinfection, the *non-potable* water shall contain not more than 4 mg/L of chloramines or free chlorine when tested in accordance with ASTM D1253. Where ozone is used for disinfection, the *non-potable* water shall not contain gas bubbles having elevated levels of ozone at the point of use.

1301.2.2 Filtration required. *Non-potable* water utilized for water closet and urinal flushing applications shall be filtered by a 100 micron or finer filter.

> **Exception:** Reclaimed water sources shall not be required to comply with the requirements of 1301.2.1 and 1301.2.2.

1301.3 Signage required. All non-potable water outlets such as hose connections, open ended pipes, and faucets shall be identified at the point of use for each outlet with signage that reads as follows: “Non-potable water is utilized for [application name]. Caution: non-potable water. DO NOT DRINK.” The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and in colors in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 1301.3 shall appear on the signage required by this section.

Figure 1301.3 – Pictograph DO NOT DRINK

1301.4 Permits. *Permits* shall be required for the construction, installation, *alteration*, and *repair* of non-potable water systems. *Construction documents*, engineering calculations, diagrams, and other such data pertaining to the non-potable water system shall be submitted with each application for *permit*.

1301.5 Potable water connections. Where a *potable* system is connected to a non-potable water system, the *potable* water supply shall be protected against backflow in accordance with Section 608.

1301.6 Approved components and materials. Piping, plumbing components, and materials used in the collection and conveyance systems shall be manufactured of material *approved* for the intended application and compatible with any disinfection and treatment systems used.

1301.7 Insect and vermin control. The system shall be protected to prevent the entrance of insects and vermin into *storage tanks* and piping systems. Any screen materials shall be compatible with contacting system components and shall not accelerate corrosion of system components.

1301.8 Freeze protection. Where sustained freezing temperatures occur, provisions shall be made to keep *storage tanks* and the related piping from freezing.

1301.9 Non-potable water storage tanks. Where used, non-potable water *storage tanks* shall comply with Sections 1301.9.1 through 1301.9.11.

1301.9.1 Sizing. The holding capacity of the *storage tank* shall be sized in accordance with the anticipated demand.

1301.9.2 Location. *Storage tanks* shall be installed above or below grade. Above grade *storage tanks* shall be protected from direct sunlight and shall be constructed using opaque, UV resistant, materials such as, but not limited to, heavily tinted plastic, fiberglass, lined metal, concrete, wood, or painted to prevent algae growth, or shall have specially constructed sun barriers including but not limited to installation in garages, crawlspaces, or sheds. *Storage tanks* and their manholes shall not be located directly under any soil or waste piping or any source of contamination.

1301.9.3 Materials. Where collected onsite, water shall be collected in an *approved* tank constructed of durable, nonabsorbent and corrosion-resistant materials. The *storage tank* shall be constructed of materials compatible with any disinfection systems used to treat water upstream of the tank and with any systems used to maintain water quality within the tank. Wooden *storage tanks* that are not equipped with a makeup water source shall be provided with a flexible liner.

1301.9.4 Foundation and supports. *Storage tanks* shall be supported on a firm base capable of withstanding the *storage tank's* weight when filled to capacity. *Storage tanks* shall be supported in accordance with the *International Building Code*.

1301.9.4.1 Ballast. Where the soil can become saturated, an underground *storage tank* shall be ballasted, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down ballast shall meet or exceed the buoyancy force of the tank. Where the installation requires a foundation, the foundation shall be flat and shall be designed to support the *storage tank* weight when full, consistent with the bearing capability of adjacent soil.

1301.9.4.2 Structural support. Where installed below grade, *storage tank* installations shall be designed to withstand earth and surface structural loads without damage and with minimal deformation when filled with water or empty.

1301.9.5 Makeup water. Where an uninterrupted supply is required for the intended application, *potable* or reclaimed water shall be provided as a source of makeup water for the *storage tank*. The makeup water supply shall be protected against backflow in accordance with Section 608. A full-open valve located on the makeup water supply line to the *storage tank* shall be provided. Inlets to *storage tank* shall be controlled by fill valves or other automatic supply valves installed so as to prevent the tank from overflowing and to prevent the water level from dropping below a predetermined point. Where makeup water is provided, the water level shall not be permitted to drop below the source water inlet or the intake of any attached pump.

1301.9.6 Overflow. The *storage tank* shall be equipped with an overflow pipe having a diameter not less than that shown in Table 606.5.4 The overflow pipe shall be protected from insects or vermin and shall be discharged in a manner consistent with storm water runoff requirements of the jurisdiction. The overlow piope shall discharge at a sufficient distance from the tank to avoid damaging the tank foundation or the adjacent property. Drainage from overflow pipes shall be directed so as not to freeze on roof walks. The overflow drain shall not be equipped with a shutoff valve. A cleanout shall be provided on each overflow pipe in accordance with Section 708.

1301.9.7 Access. A minimum of one access opening shall be provided to allow inspection and cleaning of the tank interior. Access openings shall have an *approved* locking device or other *approved* method of securing access. Below grade *storage tanks*, located outside of the *building*, shall be provided with either a manhole not less than 24 inches (610 mm) square or a manhole with an inside diameter not less than 24 inches (610 mm) . Manholes shall extend not less than 4 inches above ground or shall be designed to as to prevent water infiltration. Finished grade shall be sloped away from the manhole to divert surface water from the manhole. Each manhole cover shall be secured to prevent unauthorized access. Service ports in manhole covers shall be not less than 8 inches (203 mm) in diameter and shall be a minimum of 4 inches (102 mm) above the finished grade level. The service port be secured to prevent unauthorized access.

> **Exception:** *Storage tanks* under 800 gallons in volume installed below grade shall not be required to be equipped with a manhole, but shall have a service port not less than 8 inches (203 mm) in diameter.

1301.9.8 Venting. *Storage tanks* shall be provided with a vent sized in accordance with Chapter 9 and based on the aggregate diameter of all tank influent pipes. The reservoir vent shall not be connected to sanitary drainage system vents. Vents shall be protected from contamination by means of a U-bend installed with the opening directed downward or an *approved* cap. Vent outlets shall extend a minimum of 4” above grade, or as necessary to prevent surface water from entering the *storage tank*. Vent openings shall be protected against the entrance of vermin and insects in accordance with the requirements of Section 1307.1.

1301.9.9 Draining of tanks. Where tanks require draining for service or cleaning, tanks shall be drained by using a pump or by a drain located at the lowest point in the tank The tank drain pipe shall discharge as required for overflow pipes and shall not be smaller in size than specified in Table 606.5.7. A minimum of one cleanout shall be provided on each drain pipe in accordance with Section 708.

1301.9.10 Marking and signage. Each non-potable water *storage tank* shall be *labeled* with its rated capacity. The contents of *storage tanks* shall be identified with the words “CAUTION: NON-POTABLE WATER – DO NOT DRINK.” Where an opening is provided that could allow the entry of personnel, the opening shall be marked with the words, “DANGER – CONFINED SPACE.” Markings shall be indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material mounted on the tank or shall be indelibly printed on the tank. The letters of the words shall be not less than 0.5 inches in height and shall be of a color in contrast with the background on which they are applied.

1301.9.11 Storage tank tests. *Storage tanks* shall be tested in accordance with the following:

Storage tanks shall be filled with water to the overflow line prior to and during inspection. All seams and joints shall be left exposed and the tank shall remain water tight without leakage for a period of 24 hours.

1. After 24 hours, supplemental water shall be introduced for a period of 15 minutes to verify proper drainage of the overflow system and verify that there are no leaks.

2. The tank drain shall be observed for proper operation.
3. The makeup water system shall be observed for proper operation and successful automatic shutoff of the system at the refill threshold shall be verified.

1301.10 System abandonment. If the owner of an onsite non-potable water reuse system or *rainwater collection and conveyance system* elects to cease use of, or fails to properly maintain such system, the system shall be abandoned and shall comply with the following:

1. All system piping connecting to a utility-provided water system shall be removed or disabled.
2. The *distribution piping* system shall be replaced with an *approved potable* water supply piping system. Where an existing *potable* pipe system is already in place, the fixtures shall be connected to the existing system.
3. The storage tank shall be secured from accidental access by sealing or locking tank inlets and access points, or filling with sand or equivalent.

1301.11 Trenching requirements for non-potable water piping. Non-potable water collection and distribution piping and reclaimed water piping shall be separated from the *building* sewer and *potable* water piping underground by 5 feet (1524 m) of undisturbed or compacted earth. Non-potable water collection and distribution piping shall not be located in, under or above cesspools, septic tanks, septic tank drainage fields or seepage pits. Buried non-potable water piping shall comply with the requirements of Section 306.

Exceptions:

1. The required separation distance shall not apply where the bottom of the non-potable water pipe within 5 feet (1524 mm) of the sewer is not less than 12 inches (305 mm) above the top of the highest point of the sewer and the pipe materials conforms to Table 702.3.
2. The required separation distance shall not apply where the bottom of the *potable* water service pipe within 5 feet (1524 mm) of the non-potable water pipe is a minimum of 12 inches (305 mm) above the top of the highest point of the non-potable water pipe and the pipe materials comply with the requirements of Table 605.4
3. Non-potable water pipe is permitted to be located in the same trench with a building sewer, provided that such sewer is constructed of materials that comply with the requirements of Table 702.2.
4. The required separation distance shall not apply where a non-potable water pipe crosses a sewer pipe provided that the pipe is sleeved to at least 5 feet (1524 mm) horizontally from the sewer pipe centerline on both sides of such crossing with pipe materials that comply with Table 702.2.
5. The required separation distance shall not apply where a *potable* water service pipe crosses a non-potable water pipe provided that the *potable* water service pipe is sleeved for a distance of at least 5 feet (1524 mm) horizontally from the centerline of the non-potable pipe on both sides of such crossing with pipe materials that comply with Table 702.2.
6. Irrigation piping located outside of a *building* and downstream of the backflow preventer is not required to meet the trenching requirements where non-potable water is used for outdoor applications.

1301.12 Outdoor outlet access. Sillcocks, hose bibs, wall hydrants, yard hydrants, and other outdoor outlets supplied by *non-potable* water shall be located in a locked vault or shall be operable only by means of a removable key.

SECTION 1302
ONSITE NON-POTABLE WATER REUSE SYSTEMS

1302.1 General. The provisions of Section 1302 shall govern the construction, installation, *alteration,* and *repair* of *onsite non-potable water reuse systems* for the collection, storage, treatment and distribution of on-site sources of non-potable water as permitted by the jurisdiction.

1302.2 Sources. Onsite non-potable water reuse systems shall collect waste discharge from only the following sources: bathtubs, showers, lavatories, clothes washers, and laundry trays. Water from other approved non-potable sources including swimming pool backwash operations, air conditioner condensate, rainwater, cooling tower blow-down water, foundation drain water, steam system condensate, fluid cooler discharge water, food steamer discharge water, combination oven discharge water, industrial process water, and fire pump test water shall also be permitted to be collected for reuse by onsite non-potable water reuse systems, as approved by the code official and as appropriate for the intended application.

1302.2.1 Prohibited sources. Wastewater containing urine or fecal matter shall not be diverted to onsite non-potable water reuse systems and shall discharge to the sanitary drainage system of the building or premises in accordance with Chapter 7. Water from reverse osmosis system reject water, water softener discharge water, kitchen sink wastewater, dishwasher wastewater, and wastewater discharged from wet-hood scrubbers shall not be collected for reuse within a to onsite non-potable water reuse systems.

1302.3 Traps. Traps serving fixtures and devices discharging wastewater to to onsite non-potable water reuse systems shall comply with the Section 1002.4.

1302.4 Collection pipe. Onsite non-potable water reuse systems shall utilize drainage piping *approved* for use within plumbing drainage systems to collect and convey untreated water for reuse. Vent piping *approved* for use within plumbing venting systems shall be utilized for vents within the graywater system. Collection and vent piping materials shall comply with Section 702.

1302.3.1 Installation. Collection piping conveying untreated water for reuse shall be installed in accordance with Section 704.

1302.3.2 Joints. Collection piping conveying untreated water for reuse shall utilize joints *approved* for use with the *distribution piping* and appropriate for the intended applications as specified in Section 705.

1302.3.3 Size. Collection piping conveying untreated water for reuse shall be sized in accordance with drainage sizing requirements specified in Section 710.

1302.3.4 Labeling and marking. Additional marking of collection piping conveying untreated water for reuse shall not be required beyond that required for sanitary drainage, waste, and vent piping by the Chapter 7.

1302.5 Filtration. Untreated water collected for reuse shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gage or other *approved* method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves installed immediately upstream and downstream to allow for isolation during maintenance.

1302.6 Disinfection. Where the intended application for non-potable water collected onsite for reuse requires disinfection or other treatment or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use. Non-potable water collected onsite containing untreated *graywater* shall be retained in collection reservoirs for a maximum of 24 hours.

1302.7 Storage tanks. *Storage tanks* utilized in onsite non-potable water reuse systems shall comply with Section 1301.9.

1302.7.1 Location. *Storage tanks* shall be located with a minimum horizontal distance between various elements as indicated in Table 1302.7.1.

TABLE 1302.7.1
LOCATION OF NON-POTABLE WATER REUSE STORAGE TANKS

ELEMENT	MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (FEET)
Critical root zone (CRZ) of protected trees	2
Lot line adjoining private lots	5
Seepage pits	5
Septic tanks	5
Water wells	50
Streams and lakes	50
Water service	5
Public water main	10

1302.7.3 Outlets. Outlets shall be located at least 4 inches (102 mm) above the bottom of the *storage tank*, and shall not skim water from the surface.

1302.8 Valves. Valves shall be supplied on onsite non-potable water reuse systems in accordance with Sections 1302.8.1 and 1302.8.2.

1302.8.1 Bypass valve. One three-way diverter valve listed and labeled to NSF 50 or other *approved* device shall be installed on collection piping upstream of each *storage tank*, or drainfield, as applicable, to divert untreated onsite reuse sources to the sanitary sewer to allow servicing and inspection of the system. Bypass valves shall be installed downstream of fixture traps and vent connections Bypass valves shall be *marked* to indicate the direction of flow, connection and *storage tank* or drainfield connection. Bypass valves shall be installed in accessible locations. Two shutoff valves shall not be installed to serve as a bypass valve.

1302.8.2 Backwater valve. One or more *backwater valves* shall be installed on each overflow and tank drain pipe. *Backwater valves* shall be in accordance with Section 715.

1302.9 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform *repair*, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall appropriate for the application and in accordance with Section 604.

1302.10 Water-pressure reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the nonnpotable water distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8.

1302.11 Distribution pipe. *Distribution piping* utilized in onsite non-potable water reuse systems shall comply with Sections 1302.11.1 through 1302.11.4.

Exception: Irrigation piping located outside of the *building* and downstream of a backflow preventer.

1302.11.1 Materials, joints and connections. *Distribution piping* shall conform to the standards and requirements specified in Section 605.

1302.11.2 Design. Onsite non-potable water reuse distribution piping systems shall be designed and sized in accordance with Section 604 for the intended application.

1302.11.3 Marking. Onsite non-potable water distribution piping labeling and marking shall comply with Section 608.8.

1302.12 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1302.12.1 through 1302.12.6.

1302.12.1 Collection pipe and vent test. Drain, waste and vent piping used for onsite water reuse systems shall be tested in accordance with Section 312.

1302.12.2 Storage tank test. *Storage tanks* shall be tested in accordance with the Section 1301.9.11.

1302.12.3 Water supply system test. The testing of makeup water supply piping and *distribution piping* shall be conducted in accordance with Section 312.5.

1302.12.4 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and *backwater valves* shall be conducted in accordance with Section 312.10.

1302.12.5 Inspection vermin and insect protection. Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the *storage tank* and piping systems in accordance with Section 1301.7.

1302.12.6 Water quality test. The quality of the water for the intended application shall be verified at the point of use in accordance with the requirements of the *jurisdiction*.

1302.13 Operation and maintenance manuals. Operations and maintenance materials shall be supplied with non-potable onsite water reuse systems in accordance with Sections 1302.13.1 through 1302.13.4.

1302.13.1 Manual. A detailed operations and maintenance manual shall be supplied in hardcopy form with all systems.

1302.13.2 Schematics. The manual shall include a detailed system schematic, locations of all system components, and a list of all system components including manufacturer and model number.

1302.13.3 Maintenance procedures. The manual shall provide a maintenance schedule and procedures for all system components requiring periodic maintenance. Consumable parts including filters shall be noted along with part numbers.

1302.13.4 Operations procedures. The manual shall include system startup and shutdown procedures. The manual shall include detailed operating procedures for the system.

SECTION 1303
NON-POTABLE RAINWATER COLLECTION AND DISTRIBUTION SYSTEMS

1303.1 General. The provisions of Section 1303 shall govern the construction, installation, *alteration,* and *repair* of *rainwater collection and conveyance systems* for the collection, storage, treatment and distribution of rainwater for non-potable applications, as permitted by the jurisdiction.

1303.2 Collection surface. *Rainwater* shall be collected only from above-ground impervious roofing surfaces constructed from *approved* materials. Collection of water from vehicular parking or pedestrian surfaces shall be prohibited except where the water is used exclusively for landscape irrigation. Overflow and bleed-off pipes from roof-mounted appliances including but not limited to evaporative coolers, water heaters, and solar water heaters shall not discharge onto *rainwater* collection surfaces.

1303.3 Debris excluders. Downspouts and leaders shall be connected to a *roof washer* and shall be equipped with a debris excluder or equivalent device to prevent the contamination of collected *rainwater* with leaves, sticks, pine needles and similar material. Debris excluders and equivalent devices shall be self-cleaning.

1303.4 Roof washer. A sufficient amount of *rainwater* shall be diverted at the beginning of each rain event, and not allowed to enter the *storage tank*, to wash accumulated debris from the collection surface. The amount of rainfall to be diverted shall be field adjustable as necessary to minimize *storage tank* water contamination. The *roof washer* shall not rely on *manually* operated valves or devices, and shall operate automatically. Diverted *rainwater* shall not be drained to the roof surface, and shall be discharged in a manner consistent with the storm water runoff requirements of the *jurisdiction*. *Roof washers* shall be accessible for maintenance and service.

1303.5 Roof gutters and downspouts. Gutters and downspouts shall be constructed of materials that are compatible with the collection surface and the *rainwater* quality for the desired end use. Joints shall be made water-tight.

1303.5.1 Slope. Roof gutters, leaders, and *rainwater* collection piping shall slope continuously toward collection inlets. Gutters and downspouts shall have a slope of not less than 1/8 inch per foot along their entire length, and shall not permit the collection or pooling of water at any point.

> **Exception:** Siphonic drainage systems installed in accordance with the manufacturer's installation instructions shall not be required to have slope.

1303.5.2 Size. Gutters and downspouts shall be installed and sized in accordance with Section 1106.6 and local rainfall rates.

1303.5.3 Cleanouts. Cleanouts shall be provided in the water conveyance system so as to allow access to all filters, flushes, pipes and downspouts.

1303.6 Drainage. Water drained from the *roof washer* or debris excluder shall not be drained to the sanitary sewer. Such water shall be diverted from the *storage tank* and discharge in a location that will not cause erosion or damage to property in accordance with the *International Building Code*. *Roof washers* and debris excluders shall be provided with an automatic means of self draining between rain events, and shall not drain onto roof surfaces.

1303.7 Collection pipe. Rainwater collection and conveyance systems shall utilize drainage piping *approved* for use within plumbing drainage systems to collect and convey captured rainwater. Vent piping *approved* for use within plumbing venting systems shall be utilized for vents within the rainwater system. Collection and vent piping materials shall comply with Section 702.

1303.7.1 Installation. Collection piping conveying captured rainwater shall be installed in accordance with Section 704.

1303.7.2 Joints. Collection piping conveying captured rainwater shall utilize joints *approved* for use with the *distribution piping* and appropriate for the intended applications as specified in Section 705.

1303.7.3 Size. Collection piping conveying captured rainwater shall be sized in accordance with drainage sizing requirements specified in Section 710.

1303.7.4 Labeling and marking. Additional marking of collection piping conveying captured rainwater for reuse shall not be required beyond that required for sanitary drainage, waste, and vent piping by the Chapter 7.

1303.8 Filtration. Collected rainwater shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gage or other *approved* method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves installed immediately upstream and downstream to allow for isolation during maintenance.

1303.9 Disinfection. Where the intended application for rainwater requires disinfection or other treatment or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use. Where chlorine is used for disinfection or treatment, water shall be tested for residual chlorine in accordance with ASTM D1253. The levels of residual chlorine shall not exceed the levels allowed for the intended use in accordance with the requirements of the *jurisdiction*.

1303.10 Storage tanks. *Storage tanks* utilized in non-potable rainwater collection and conveyance systems shall comply with Section 1301.9 and 1303.10.1 through 1303.10.3.

1303.10.1 Location. *Storage tanks* shall be located with a minimum horizontal distance between various elements as indicated in Table 1303.10.1.

TABLE 1303.10.1
LOCATION OF RAINWATER STORAGE TANKS

ELEMENT	**MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (FEET)**
Critical root zone (CRZ) of protected trees	2
Lot line adjoining private lots	5
Seepage pits	5
Septic tanks	5

1303.10.2 Inlets. *Storage tank* inlets shall be designed to introduce collected rainwater into the tank with minimum turbulence, and shall be located and designed to avoid agitating the contents of the *storage tank*.

1303.10.3 Outlets. Outlets shall be located at least 4 inches (102 mm) above the bottom of the *storage tank*, and shall not skim water from the surface.

1303.11 Valves. Valves shall be supplied on rainwater collection and conveyance systems in accordance with Sections 1303.11.1 and 1303.11.2.

1303.10.2 Backwater valve. *Backwater valves* shall be installed on each overflow and tank drain pipe. *Backwater valves* shall be in accordance with Section 715.

1303.12 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform *repair*, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall appropriate for the application and in accordance with Section 604.

1303.13 Water-pressure reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the rainwater distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8.

1303.14 Distribution pipe. *Distribution piping* utilized in rainwater collection and conveyance systems shall comply with Sections 1303.14.1 through 1303.14.3.

Exception: Irrigation piping located outside of the *building* and downstream of a backflow preventer.

1303.14.1 Materials, joints and connections. *Distribution piping* shall conform to the standards and requirements specified in Section 605 for non-potable water.

1303.14.2 Design. Distribution piping systems shall be designed and sized in accordance with the Section 604 for the intended application.

1303.14.3 Marking. Non-potable rainwater distribution piping labeling and marking shall comply with Section 608.8.

1303.15 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1303.15.1 through 1303.15.8.

1303.15.1 Roof gutter inspection and test. Roof gutters shall be inspected to verify that the installation and slope is in accordance with Section 1303.5.1. Gutters shall be tested by pouring a minimum of one gallon of water into the end of the gutter opposite the collection point. The gutter being tested shall not leak and shall not retain standing water.

1303.15.2 Roofwasher test. Roofwashers shall be tested by introducing water into the gutters. Proper diversion of the first quantity of water in accordance with the requirements of Section 1303.4 shall be verified.

1303.15.3 Collection pipe and vent test. Drain, waste and vent piping used for rainwater collection and conveyance systems shall be tested in accordance with Section 312.

1303.15.4 Storage tank test. *Storage tanks* shall be tested in accordance with the Section 1301.9.11.

1303.15.5 Water supply system test. The testing of makeup water supply piping and *distribution piping* shall be conducted in accordance with Section 312.5.

1303.15.6 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and *backwater valves* shall be conducted in accordance with Section 312.10.

1303.15.7 Inspection vermin and insect protection. Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the *storage tank* and piping systems in accordance with Section 1301.7.

1303.15.8 Water quality test. The quality of the water for the intended application shall be verified at the point of use in accordance with the requirements of the *jurisdiction*. Except where site conditions as specified in ASTM E2727 affect the rainwater, collected rainwater shall be considered to have the parameters indicated in Table 1303.15.8.

TABLE 1303.15.8
RAINWATER QUALITY

PARAMETER	VALUE
pH	6.0-7.0
BOD	Not greater than 10 mg/L
NTU	Not greater than 2
Fecal Coliform	No detectable fecal coli in 100 mL
Sodium	No detectable sodium in 100 mL
Chlorine	No detectable chlorine in 100 mL
Enteroviruses	No detectable enteroviruses in 100 mL

1303.16 Operation and maintenance manuals. Operations and maintenance materials shall be supplied with rainwater collection and conveyance systems in accordance with Sections 1303.16.1 through 1303.16.4.

1303.16.1 Manual. A detailed operations and maintenance manual shall be supplied in hardcopy form with all systems.

1303.16.2 Schematics. The manual shall include a detailed system schematic, locations of all system components, and a list of all system components including manufacturer and model number.

1303.16.3 Maintenance procedures. The manual shall provide a maintenance schedule and procedures for all system components requiring periodic maintenance. Consumable parts including filters shall be noted along with part numbers.

1303.16.4 Operations procedures. The manual shall include system startup and shutdown procedures. The manual shall include detailed operating procedures for the system.

SECTION 1304
RECLAIMED WATER SYSTEMS

1304.1 General. The provisions of this section shall govern the construction, installation, *alteration*, and *repair* of systems supplying *non-potable reclaimed water*.

1304.2 Water-pressure reducing valve or regulator. Where the *reclaimed water* pressure supplied to the *building* exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the *reclaimed water* distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8 of the *International Plumbing Code*.

1304.3 Reclaimed water systems. The design of the *reclaimed water* systems shall conform to ASTM E 2635 and *accepted engineering practice.*

1304.3.1 Distribution pipe. *Distribution piping* shall comply with Sections 1304.3.1.1 through 1304.3.1.3.

> **Exception:** Irrigation piping located outside of the *building* and downstream of a backflow preventer.

1304.3.1.1 Materials, joints and connections. *Distribution piping* conveying reclaimed water shall conform to standards and requirements specified in Section 605 for non-potable water.

1304.3.1.2 Design. Distribution piping systems shall be designed and sized in accordance with the Section 604 for the intended application.

1304.3.1.3 Labeling and marking. Non-potable rainwater distribution piping labeling and marking shall comply with Section 608.8.

1304.4 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1304.4.1 and 1304.4.2.

1304.4.1 Water supply system test. The testing of makeup water supply piping and *reclaimed water distribution piping* shall be conducted in accordance with Section 312.5.

1304.4.2 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers shall be conducted in accordance with Section 312.10.

Add new Chapter and next text as follows:

CHAPTER 14
SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

SECTION 1401
GENERAL

1401.1 Scope. The provisions of Chapter 14 shall govern the materials, design, construction and installation of subsurface landscape irrigation systems connected to non-potable water from onsite water reuse systems.

1401.2 Materials. Above-ground drain, waste and vent piping for subsurface landscape irrigation systems shall conform to one of the standards listed in Table 702.1. Subsurface landscape irrigation underground building drainage and vent pipe shall conform to one of the standards listed in Table 702.2.

1401.3 Tests. Drain, waste and vent piping for subsurface landscape irrigation systems shall be tested in accordance with Section 312.

1401.4 Inspections. Subsurface landscape irrigation systems shall be inspected in accordance with Section 107.

1401.5 Disinfection. Disinfection shall not be required for onsite non-potable reuse water used for subsurface landscape irrigation systems.

1401.6 Coloring. Onsite non-potable reuse water used for subsurface landscape irrigation systems shall not be required to be dyed.

SECTION 1402
SYSTEM DESIGN AND SIZING

1402.1 Sizing. The system shall be sized in accordance with the sum of the output of all water sources connected to the subsurface irrigation system. Where gray water collection piping is connected to subsurface landscape irrigation systems, gray water output shall be calculated according to the gallons-per-day-per-occupant number based on the type of fixtures connected. The gray water discharge shall be calculated by the following equation:

C = A x B **(Equation 14-1)**

where:

A = Number of occupants:

Residential–Number of occupants shall be determined by the actual number of occupants, but not less than two occupants for one bedroom and one occupant for each additional bedroom.
Commercial–Number of occupants shall be determined by the *International Building Code.*

B = Estimated flow demands for each occupant:

Residential–25 gallons per day (94.6 lpd) per occupant for showers, bathtubs and lavatories and 15 gallons per day (56.7 lpd) per occupant for clothes washers or laundry trays.

Commercial–Based on type of fixture or water use records minus the discharge of fixtures other than those discharging gray water.

C = Estimated gray water discharge based on the total number of occupants.

1402.2 Percolation tests. The permeability of the soil in the proposed absorption system shall be determined by percolation tests or permeability evaluation.

1402.2.1 Percolation tests and procedures. At least three percolation tests in each system area shall be conducted. The holes shall be spaced uniformly in relation to the bottom depth of the proposed absorption system. More percolation tests shall be made where necessary, depending on system design.

1402.2.1.1 Percolation test hole. The test hole shall be dug or bored. The test hole shall have vertical sides and a horizontal dimension of 4 inches to 8 inches (102 mm to 203 mm). The bottom and sides of the hole shall be scratched with a sharp-pointed instrument to expose the natural soil. All loose material shall be removed from the hole and the bottom shall be covered with 2 inches (51 mm) of gravel or coarse sand.

1402.2.1.2 Test procedure, sandy soils. The hole shall be filled with clear water to a minimum of 12 inches (305 mm) above the bottom of the hole for tests in sandy soils. The time for this amount of water to seep away shall be determined, and this procedure shall be repeated if the water from the second filling of the hole seeps away in 10 minutes or less. The test shall proceed as follows: Water shall be added to a point not more than 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, water levels shall be measured at 10-minute intervals for a period of 1 hour. Where 6 inches (152 mm) of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 6 inches (152 mm). Where 6 inches (152 mm) of water seeps away in less than 2 minutes, the test shall be stopped and a rate of less than 3 minutes per inch (7.2 s/mm) shall be reported. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested in accordance with Section 1303.7.1.3.

1402.2.1.3 Test procedure, other soils. The hole shall be filled with clear water, and a minimum water depth of 12 inches (305 mm) shall be maintained above the bottom of the hole for a 4-hour period by refilling whenever necessary or by use of an automatic siphon. Water remaining in the hole after 4 hours shall not be removed. Thereafter, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately after the soil swelling period, the measurements for determining the percolation rate shall be made as follows: any soil sloughed into the hole shall be removed and the water level shall be adjusted to 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, the water level shall be measured at 30-minute intervals for a period of 4 hours, unless two successive water level drops do not vary by more than 1/16 inch (1.59 mm). At least three water level drops shall be observed and recorded. The hole shall be filled with clear water to a point not more than 6 inches (152 mm) above the gravel or coarse sand whenever it becomes nearly empty. Adjustments of the water level shall not be made during the three measurement periods except to the limits of the last measured water level drop. When the first 6 inches (152 mm) of water seeps away in less than 30 minutes, the time interval between measurements shall be 10 minutes and the test run for 1 hour. The water depth shall not exceed 5 inches (127 mm) at any time during the measurement period. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

1402.2.1.4 Mechanical test equipment. Mechanical percolation test equipment shall be of an approved type.

1402.2.2 Permeability evaluation. Soil shall be evaluated for estimated percolation based on structure and texture in accordance with accepted soil evaluation practices. Borings shall be made in accordance with Section 1402.2.1.1 for evaluating the soil.

1402.3 Subsurface landscape irrigation site location. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining lot. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table 1402.3. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.

TABLE 1402.3
LOCATION OF SUBSURFACE IRRIGATION SYSTEM

ELEMENT	MINIMUM HORIZONTAL DISTANCE	
	STORAGE TANK (feet)	**IRRIGATION DISPOSAL FIELD (feet)**
Buildings	5	2
Lot line adjoining private property	5	5
Water wells	50	100
Streams and lakes	50	50
Seepage pits	5	5
Septic tanks	0	5
Water service	5	5
Public water main	10	10

For SI: 1 foot = 304.8 mm.

SECTION 1403
INSTALLATION

1403.1 Installation. Absorption systems shall be installed in accordance with Sections 1403.1.1 through 1403.2.1 to provide landscape irrigation without surfacing of water.

1403.1.1 Absorption area. The total absorption area required shall be computed from the estimated daily gray water discharge and the design-loading rate based on the percolation rate for the site. The required absorption area equals the estimated gray water discharge divided by the design-loading rate from Table 1403.1.1.

TABLE 1403.1.1
DESIGN LOADING RATE

PERCOLATION RATE (minutes per inch)	DESIGN LOADING FACTOR (gallons per square foot per day)
0 to less than 10	1.2
10 to less than 30	0.8
30 to less than 45	0.72
45 to 60	0.4

For SI: 1 minute per inch = min/25.4 mm,
1 gallon per square foot = 40.7 L/m2.

1403.1.2 Seepage trench excavations. Seepage trench excavations shall be not less than 1 foot (304 mm) in width and not greater than 5 feet (1524 mm) in width. Trench excavations shall be spaced not less than 2 feet (610 mm) apart. The soil absorption area of a seepage trench shall be computed by using the bottom of the trench area (width) multiplied by the length of pipe. Individual seepage trenches shall be not greater than100 feet (30 480 mm) in developed length.

1403.1.3 Seepage bed excavations. Seepage bed excavations shall be not less than 5 feet (1524 mm) in width and have more than one distribution pipe. The absorption area of a seepage bed shall be computed by using the bottom of the trench area. Distribution piping in a seepage bed shall be uniformly spaced not greater than 5 feet (1524 mm) and not less than 3 feet (914 mm) apart, and greater than 3 feet (914 mm) and not less than 1 foot (305 mm) from the sidewall or headwall.

1403.1.4 Excavation and construction. The bottom of a trench or bed excavation shall be level. Seepage trenches or beds shall not be excavated where the soil is so wet that such material rolled between the hands forms a soil wire. All smeared or compacted soil surfaces in the sidewalls or bottom of seepage trench or bed excavations shall be scarified to the depth of smearing or compaction and the loose material removed. Where rain falls on an open excavation, the soil shall be left until sufficiently dry so a soil wire will not form when soil from the excavation bottom is rolled between the hands. The bottom area shall then be scarified and loose material removed.

1403.1.5 Aggregate and backfill. Not less than 6 inches in depth of aggregate ranging in size from 1/2 to 21/2 inches (12.7 mm to 64 mm) shall be laid into the trench below the distribution piping elevation. The aggregate shall be evenly distributed not less than 2 inches (51 mm) in depth over the top of the distribution pipe. The aggregate shall be covered with approved synthetic materials or 9 inches (229 mm) of uncompacted marsh hay or straw. Building paper shall not be used to cover the aggregate. Not less than 9 inches (229 mm) of soil backfill shall be provided above the covering.

1403.2 Distribution piping. Distribution piping shall be not less than 3 inches (76 mm) in diameter. Materials shall comply with Table 1303.10. The top of the distribution pipe shall be not less than 8 inches (203 mm) below the original surface. The slope of the distribution pipes shall be not less than 2 inches (51 mm) and not greater than 4 inches (102 mm) per 100 feet (30 480 mm).

TABLE 1403.2
DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F 405
Polyvinyl chloride (PVC) plastic pipe	ASTM D 2729
Polyvinyl chloride (PVC) plastic pipe with a 3.5 inch O.D. and solid cellular core or composite wall.	ASTM F 1488

1403.2.1 Joints. Joints in distribution pipe shall be made in accordance with Section 705 of this code.

Reason: The sections shown to be added to the code are from the IgCC. These sections really need to be in the IPC as these subjects are more applicable to the IPC scope. Currently, the IPC does not address different types of nonpotable water (other than gray water) and therefore provides no guidance as to how nonpotable waters are to be collected, stored and distributed. The current Chapter 13 only deals with the use/reuse of gray water for the flushing of water closets and urinals and subsurface irrigation. It is clarified that gray water and rain water recycling systems must be separate systems and may not be interconnected.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

301.3-P-STRAUSBAUGH.PMGCAC

P12 – 12
301.4

Proponent: Shawn Strausbaugh, Arlington County VA representing the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Revise as follows:

301.4 Connections to water supply. ~~Every~~ Plumbing fixtures, devices or appliances requiring or using water ~~for its proper operation~~ shall be directly or indirectly connected to the water supply system in accordance with the provisions of this code. Faucets provided with a connection for cold water shall be connected to the cold water distribution system.

Reason: The current code does not require a fixture to be supplied with cold water even if the handles or trim plate indicate cold water will be supplied when it is turned to the “on” position.. If a faucet has the “indication” that cold water can be obtained (e.g. single handle cold water position or a two handle faucet), the code should require that cold water actually be connected and provided to the faucet.

Cost Impact: none

P12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

301.4-P-STRAUSBAUGH

P13 – 12
303.1

Proponent: James Ranfone, American Gas Association (jranfon@aga.org)

Revise as follows:

303.1 Identification. Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer and any markings required by the applicable referenced standards.

> <u>**Exception:** The manufacturer identification for fittings and pipe nipples shall be on each piece or shall be printed on the packaging or provided documentation.</u>

Reason: The exception would allow identification of fittings to be provided on or with the packaging. Some piping fittings, short couplings for example, do not have the physical room for a manufacturers mark.

Cost Impact: The code change proposal will not increase the cost of construction.

P13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.1-P-RANFONE

P14 – 12
303.3, 611.3

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self. (JBEngineer@aol.com)

Delete without substitution:

~~**303.3 Plastic pipe, fittings and components.** All plastic pipe, fittings and components shall be third-party certified as conforming to NSF 14.~~

Revise as follows:

611.3 Connection tubing. The tubing to and from drinking water treatment units shall be of a size and material as recommended by the manufacturer. The tubing shall comply with ~~NSF 14,~~ NSF 42, NSF 44, NSF 53, NSF 58 or NSF 61.

Reason: With the addition of Section 303.4 to the 2012 edition, there is no need to have a separate reference to NSF 14. All plumbing material must be listed by a third party certifier.

NSF 14 was originally inserted into the code as a quality control standard. In the latest edition of NSF 14, material requirements were added. It is completely inappropriate for a quality control standard to have material requirements. The material requirements belong in the material standards that are listed in the code (and referenced in NSF 14), not a quality control standard. With the change to NSF 14, it is no longer a viable quality control standard. It has crossed over to being a quazi-material standard. All material standards should be complete material standards regulating the full requirements of the material. NSF 14 does not do this.

For these reasons, NSF 14 should no longer be referenced in the International Plumbing Code.

Cost Impact: This may reduce the cost of certain plumbing products.

P14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.3-P-BALLANCO

P15 – 12
305.1

Proponent: Shawn Strausbaugh, Arlington County VA representing the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Delete and substitute as follows:

~~**305.1 Corrosion.** Pipes passing through concrete or cinder walls and floors or other corrosive material shall be protected against external corrosion by a protective sheathing or wrapping or other means that will withstand any reaction from the lime and acid of concrete, cinder or other corrosive material. Sheathing or wrapping shall allow for movement including expansion and contraction of piping. The wall thickness of the material shall be not less than 0.025 inch (0.64 mm).~~

<u>**305.1 Corrosion.** Metallic piping shall not be installed in direct contact with concrete, masonry or corrosive soil. Where plastic sheathing is used to prevent direct contact, the wall thickness of the sheathing shall be not less than 0.006 inches (6 mil) (0.152 mm) thick .</u>

Reason: The intent of the code is to protect piping from direct contact with concrete, masonry and corrosive soils, this proposal is a cleanup action to clarify that intent. The commonly used plastic sheathing for pipe protection has a wall thickness of only 0.004 inches or 0.006 inches thick. The 0.025 inch thick material is really unnecessary and beyond the minimum standard practice used to protect the piping system. The thinner material has been used for years with satisfactory results.

Cost Impact: none

P_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

305.1-P-STRAUSBAUGH

P16 – 12

305.6, 305.6.1 (New), 305.6.2 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

305.6 Protection against physical damage. In concealed locations where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1-1/2 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. Such shield plates shall have a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage). Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates<u>,</u> ~~and~~ below top plates <u>and to each side of a stud, joist, rafter or similar member.</u>

<u>**305.6.1 Formed steel framing members.** *Piping*, other than cast-iron or galvanized steel, shall not be installed within the channel of a formed steel framing member except where the piping is not less than 1-1/2 inches from the backside of any fastening face of the member.</u>

<u>**305.6.2 Piping installed parallel to framing members**. In concealed locations where *piping*, other than cast-iron or galvanized steel, is installed parallel to studs, joists, rafters or similar members less than 1-1/2 inches (38 mm) from the nearest edge of the member, such pipe shall be protected along its length by steel shield plates that comply with the requirements of Section 305.6.</u>

Reason: Like the IPC, Section 404.7 does not address pipe or tubing run down the side of a stud or inside of a "C" channel metal stud or rafter. Such installations are subject to penetrations but the code addresses only holes and notches for pipe and tubing that runs perpendicular to the framing member. The NEC treats wiring that runs parallel to framing members the same as wiring that runs perpendicular. The IMC, IFGC and IPC need to catch up. If the sheeting material fasteners miss a framing member, they can easily penetrate piping which is why the code requires the protection shield to extend 2 inches above and below wall plates. Placing piping parallel to a member, either on the side or within a channel, exposes the piping to penetration, yet current code addresses only perpendicular penetrations.Given the speed at which drywall installers put up and fasten drywall to studs and rafters, there is a great potential for drywall screws or nails to miss the intended stud and hit a pipe or tube. The code already requires that shield plates on sole plates and top plates extend 2 inches above and below the edges of those framing members. Why should not piping to the sides of framing members be protected to the same degree?

Section 305.6.1 is being added to prohibit piping from being installed within 1-1/2 inches of the backside of the fastening flange of a formed steel member. Piping located in this area is likely to be penetrated by drywall fasteners. An all too common practice is to install piping "inside" of formed steel members such that the piping is within 1-1/2" of the fastening face of the member. It is unrealistic to protect the piping with steel shield plates as installing the shield plates requires the installation fasteners. Piping just should not be placed in this location.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

305.6-P-STRAUSBAUGH.PMGCAC

P17 – 12
307.5

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Delete and substitute as follows:

~~**307.5 Protection of footings.** Trenching installed parallel to footings shall not extend below the 45-degree (0.79 rad) bearing plane of the footing or wall~~.

307.5 Protection of footings. Trenching installed parallel to footings and walls shall not extend into the bearing plane of a footing or wall. The upper boundary of the bearing plane is a line that extends downward, at an angle of 45 degrees from horizontal, from the outside bottom edge of the footing or wall.

Reason: The current language is not especially clear and is easily misunderstood. The proposed text is explicit and captures the intent of this provision.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.5-P-STRAUSBAUGH.PMGCAC

P18 – 12
308.5

Proponent: James Paschal, Paschal Engineering representing himself (Jim@PaschalEngineering.com)

Revise as follows:

308.5 Interval of support. Pipe shall be supported in accordance with Table 308.5.

> **Exception:** The interval of support for piping systems designed to provide for expansion/contraction shall conform to the engineered design in accordance with Section 316.1. <u>The interval of support for fiberglass or metal reinforced plastic piping shall be in accordance with the manufacturer's specifications and shall conform to the engineered design in accordance with Section 316.1.</u>

Reason: There are a variety of plastic piping systems available which utilize metal or fiberglass reinforcement to add rigidity and strength to the piping, and as a result, may require different support spacing than the traditional materials shown in Table 308.5. In addition to the existing requirement that the spacing be per the engineered design and approved by the code official, the proposed wording here also requires that the spacing be per the manufacturer's specifications. This will ensure that the spacing is consistent between the design professional, code official, and manufacturer.

Cost Impact: None

P18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.5-P-PASCHAL

P19 – 12
Table 308.5

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

TABLE 308.5
HANGER SPACING

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
ABS pipe	4	10[b]
Aluminum tubing	10	15
Brass pipe	10	10
Cast-iron pipe	5[a]	15
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing, $1^1/_4$-inch diameter and smaller	6	10
Copper or copper-alloy tubing, $1^1/_2$-inch diameter and larger	10	10
Cross-linked polyethylene (PEX) pipe	2.67 (32 inches)	10[b]
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	2.67 (32 inches)	4
CPVC pipe or tubing, 1 inch and smaller	3	10[b]
CPVC pipe or tubing, $1^1/_4$ inches and larger	4	10[b]
Steel pipe	12	15
Lead pipe	Continuous	4
Polyethylene/aluminum/polyethylene (PE-AL-PE) pipe	2.67 (32 inches)	4
Polyethylene of raised temperature (PE-RT) pipe	2.67 (32 inches)	10[b]
Polypropylene (PP) pipe or tubing 1 inch and smaller	2.67 (32 inches)	10[b]

Polypropylene (PP) pipe or tubing, 1 1/4 inches and larger	4	10[b]
PVC pipe	4	10[b]
Stainless steel drainage systems	10	10[b]

a. The maximum horizontal spacing of cast iron pipe hangers shall be increased to 10 feet where 10 foot lengths of pipe are installed.

b. ~~Mid-story guide~~ For sizes 2 inches and smaller, a guide shall be installed midway between required vertical supports. Such guides shall prevent pipe movement in a direction perpendicular to the axis of the pipe.

Reason: What constitutes a "mid-story guide" and what is it supposed to do? The current footnote doesn't clearly state a requirement. What is the purpose of the guide and how limiting is the guide supposed to be? The term mid-story seems out of context considering that the intent of the footnote is to require a guide midway between vertical supports. The vertical supports don't necessarily correspond to a support at each story. Stories can be any height. The revised language provides the necessary information to make this footnote clearly state the intent.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T308.5-P-STRAUSBAUGH.PMGCAC

P20 – 12
309.2

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC STRUCTURAL DEVELOPMENT COMMITTEE.

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Revise as follows:

[B] 309.2 Flood hazard. For structures located in flood hazard areas, the following systems and equipment shall be located and installed as required by Section 1612 of the *International Building Code*.

> ~~**Exception:** The following systems are permitted to be located below the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to up to such elevation.~~

1. ~~All~~ water service pipes.
2. Pump seals in individual water supply systems where the pump is located below the *design flood elevation*.
3. Covers on potable water wells shall be sealed, except where the top of the casing well or pipe sleeve is elevated to not less than 1 foot (305 mm) above the *design flood elevation*.
4. ~~All~~ Sanitary drainage piping.
5. ~~All~~ Storm drainage piping.
6. Manhole covers shall be sealed, except where elevated to or above the *design flood elevation*.
7. ~~All~~ Other plumbing fixtures, faucets, fixture fittings, piping systems and equipment.
8. Water heaters.
9. Vents and vent systems.

   <u>**Exception:** The systems listed in this section are permitted to be located below the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment provided that the systems are designed and installed to prevent water from entering our accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such elevation.</u>

Reason: This proposal simply moves the exception language below the list. It is awkward and certainly confusing to have the exception placed between the parent language “the following systems and equipment”) and the list. This change is editorial. ICC staff recommended deletion of “all” in four locations.

Cost Impact: The code change proposal will not increase the cost of construction.

P20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

309.2-P-INGARAGIOLA-WILSON-QUINN.doc

P21 – 12
311.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

311.1 General. Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction worker toilet facilities of the nonsewer type shall conform to ANSI Z4.3. <u>Not less than one portable toilet facility for every 50 workers or fraction thereof shall be provided.</u>

Reason: The code currently provides no guidance as to how many portable toilet facilities are needed for construction sites. To save money, a contractor could provide just one toilet facility for hundreds of workers. The ratio of 1 per fifty workers is reasonable.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

311.1-P-STRAUSBAUGH.PMGCAC

P22 – 12
317 (New)

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

SECTION 317
ELECTRICAL

317.1 Grounding. Metallic underground water piping shall be permitted to be used as a grounding electrode in accordance with NFPA 70.

317.2 Connections. Electrical connections between appliances and the building wiring, including the grounding of the appliances, shall conform to NFPA 70.

Reason: Electrical safety issues with regard to plumbing, including plumbing appliances, should be covered in the IPC. Added text will address concerns associated with accidental contact between water and electricity.

Cost Impact: None

P22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

317 (NEW)-P-EUGENE

P23 – 12
317 (New)

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Add new text as follows:

SECTION 317
ELECTRICAL BONDING

317.1 Grounding and bonding of metallic piping. Aboveground portions of a metallic piping system that are likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path in accordance with NFPA 70. Piping shall be considered to be bonded where it is connected to *plumbing appliances* that are connected to the equipment grounding conductor of the circuit supplying that *plumbing appliance.*

Reason: Electrical safety issues with regard to plumbing, including plumbing appliances, should be covered in the IPC. Added text will address concerns associated with accidental contact between water and electricity.

Cost Impact: None

P23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

317 #2-P-EUGENE

P24 – 12
317 (New), 317.1 (New)

Proponent: Guy McMann, MCP representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Add new text as follows:

SECTION 317
INSULATION PROTECTION

317.1 Protection of piping Insulation. Pipe insulation exposed to weather shall be listed and labeled for exterior use or otherwise protected in accordance with the manufacturer's installation instructions. Insulation subject to physical damage shall be protected with shields or by approved methods.

Reason. Pipe insulation exposed to the elements needs to be protected from solar and UV effects and should be listed for such exposure when applied in this situation. Insulation must also be protected in locations where maintenance or other activity takes place that may damage the installation. This is information the plan reviewer, inspector or installer would need to be aware of at the planning stage of a project.

Cost Impact: None

P24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

317 (NEW)-P-MCMANN

P25– 12
403.1 (IBC [P]2902.1), Table 403.1 (IBC Table[P]2902.1)

Proponent: Matt Archer, Douglas County, CO, representing the Colorado Chapter ICC (marcher@douglas.co.us)

Revise as follows:

403.1 (IBC [P]2902.1) Minimum number of fixtures. Plumbing fixtures shall be provided for the type of function ~~occupancy~~ and in the minimum number shown in Table 403.1. Types of functions ~~occupancies~~ not shown in Table 403.1 shall be considered individually by the code official. ~~The number of occupants shall be determined by the International Building Code. Occupancy classification shall be determined in accordance with the International Building Code.~~

~~TABLE 403.1 (IBC Table [P]2902.1)~~
~~MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURESa~~
~~(See Sections 403.2 and 403.3)~~

TABLE 403.1 (IBC Table [P]2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR [b, c]	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN [,f g] (SEE SECTION 410.1)	OTHER
		MALE	FEMALE	MALE	FEMALE			
Assembly Art gallery/ exhibition hall/ museum Court rooms (other than fixed seating) Gaming floors (keno, slots) Gymnasium/ locker room/ exercise area Library Reading rooms Stack areas Multiuse assembly area Religious services or place of worship Seating (fixed) Seating (not fixed) Skating rinks, swimming pools	30 gross 40 net 11 gross 50 gross - 50 net 100 gross 7 net - 1per seat[d] 7 net 50 gross	1per 150	1per 75	1 per 200		–	1 per 1000	1 service sink
Assembly with fixed seating (Bleachers, theaters, performing arts)	1 per seat[d]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	–	1 per 1000	1 service sink
Assembly without fixed seating (Bars, night clubs, performing arts)	5 net	1 per 40		1 per 75		–	1 per 500	1 service sink
Correctional Facility Employee (see	-	1 per cell		1 per cell		1 per 15	1 per 100	1 service sink

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR [b, c]	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN [f g] (SEE SECTION 410.1)	OTHER
		MALE	FEMALE	MALE	FEMALE			
Office) Prison Visitor area (see Office)	- -							
Day care (Adult or child care)	35 net	1 per 15		1 per 15		1	1 per 100	1 service sink
Educational Auditoriums (fixed seating) Classroom areas Dance studio/ martial art space Gymnasium/ locker room/ exercise area Multiuse assembly areas	1per seat[d] 20 net 50 gross 50 gross 7 net	1 per 50		1 per 50		_	1 per 100	1 service sink
Factory and Storage Assembly or processing of materials Fabricating Freight depot Warehouse	500 gross	1 per 100		1 per 100		See Section 411	1 per 400 1 per 400 1 per 1000 1 per 1000	1 service sink
Food and beverage services Banquet hall Kitchen Seating (booths) Seating (tables and chairs) Takeout/ order area Waiting/ lobby area	15 net 200 gross 1 per seat[d] 15 net 15 net 15 net	1 per 75		1 per 200		_	1 per 500	1 service sink
Hospital, nursing home Employee (see Office) Patient room Visitor area (see Office)	- - -	1 per room[f]		1 per room[f]		1 per 15	1 per 100	1 service sink
Office Accessory areas Closets/ filing rooms Corridors/ lobby areas Conference/ meeting rooms Office/ work spaces Reception/ waiting areas Shipping and receiving areas Training/ classroom areas Warehouse areas	- - - 15 net 100 gross 15 net 300 gross 20 net 500 gross	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		_	1 per 100	1 service sink[h]
Passenger terminals Baggage claim Baggage handling Concourse Waiting areas	20 gross 300 gross 100 gross 15 net	1 per 500		1 per 750		_	1 per 1000	1 service sink
Residential Multi-family (apartments)	_	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	_	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[b, c]	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[f, g] (SEE SECTION 410.1)	OTHER
		MALE	FEMALE	MALE	FEMALE			
One- and two-family dwelling	–						–	20 dwelling units ---------------- 1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
Residential, transient (Boarding house, hotel, motel)	-	1 per sleeping unit		1 per sleeping unit		1 per sleeping unit	–	1 service sink
Residential, non-transient (Congregate living, dormitories, fraternities, sororities, group home)	200 gross	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
Retail Mall common areas (covered and open) Sales area Shipping and receiving areas Warehouse/ Storage room	(.0007)(GLA)+25[e] 30 gross 300 gross 500 gross	1 per 500		1 per 750		-	1 per 1000	1 service sink[h]

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. Floor area in square foot per occupant.
b. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
c. Fixed seating without dividing arms shall be one person for each 18” of seating length. Booth seating shall be one person for each 24” of seating length, measured at the back rest.
d. GLA, the gross leasable area (square feet)
e. The minimum number of required drinking fountains shall comply with Table 403.1 and Chapter 11 of the International Building Code.
f. Drinking fountains are not required for an occupant load of 15 or fewer.
g. For business and mercantile occupancies with an occupant load of 15 or fewer, service sinks shall not be required.

Reason: This code change is intended to place the methodology for occupant load assessment for plumbing fixtures under the purview of the IPC Code Development Committee. Currently, occupant loads are derived from the IBC means of egress chapter. These egress-oriented occupant loads are intended to represent conservative loading at highest anticipated occupancy. This is essential to the IBC’s primary life safety goal of ensuring adequate egress capacity.

During the past several years, members of our Chapter have encountered designs using less than adequate occupant loads for egress purposes. When asked, designers involved have indicated that they were trying to moderate plumbing fixture counts to a level more representative of “normal” levels of building occupant loads. In their effort to justify fewer plumbing fixtures, the design capacity of the egress system was affected. This could result in serious life safety detriment.

Assessment of plumbing fixture counts using an occupant load basis is appropriate for determining fixture counts. This change intends to provide for that assessment independently of the IBC means of egress chapter. This change will allow the IPC Code Development Committee to have complete ownership over the appropriate occupant load factor to be employed for each use group represented within the building.

The change from “occupancy” group to “function” is imperative for proper assessment of buildings with uses that may be denser than an occupancy classification may imply. For instance, a building made up of multiple conference spaces, each of which under the 50 occupant Group A assembly classification, may be classified as a Group B Occupancy. In reality, the assembly use of the conference spaces has a much higher density of 5-7 times that ascribed to a Group B. This change allows the IPC Committee to assign fixtures based on that actual use, not just the overall and frequently limiting occupancy classification.

This change does not intend to either increase or decrease the amount of plumbing fixtures currently required by the IPC. It is intended to provide an independent, function-based assessment method that is similar to that tried and proven in the IMC. Ultimately, better assessment will be assured and the primary life safety required of the means of egress system will be assured. If approved, the committee may adjust these values as they see fit, without unintended consequence to the building’s means of egress system.

Cost Impact: None

P25-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.1-P-ARCHER

P26 – 12
403.1 (IBC [P] 2902.1)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self. (JBEngineer@aol.com)

Revise as follows:

403.1 (IBC [P] 2902.1) Minimum number of fixtures. Plumbing fixtures shall be provided ~~for the type of occupancy and~~ in the minimum number as shown in Table 403.1 based upon the actual use of the building or space. ~~Types of occupancies~~ Uses not shown in Table 403.1 shall be considered individually by the code official. The number of occupants shall be determined by the International Building Code. ~~Occupancy classification shall be determined in accordance with the International Building Code.~~

Reason: The purpose of the table is to provide fixtures based on the use of the building space, not based on the use group classification. By referencing the use group in accordance with the Building Code, an incorrect number of fixtures may be established for a building. A typical example is a mixed use building. Each use must be considered separately as to the fixture demands. Another example would be a high school that has a cafeteria, an auditorium for productions, and a stadium for sporting events. Each space would have different requirements. The listing of the use group in the table was done merely for convenience. The fixture demands have always been based on the use of the space.

Cost Impact: There is no impact to the cost of a building.

P26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.1-P-BALLANCO

P27 – 12

202 (IBC 202), 403.1 (IBC [P]2902.2.1), Table 403.1 (IBC Table [P]2902.1), Table 403.1.2 (New) (IBC Table [P]2902.1.2 (New))

Proponent: Eirene Oliphant, MCP, BRR Architecture, representing self

Add new definitions as follows:
(Definitions to also be added to the IBC)

ATHLETIC FIELDS. Outdoor sporting venues that contain spectator seating in the form of *grandstands* or *bleachers*, excluding stadiums and coliseums.

BLEACHERS. Tiered seating that is supported on a dedicated structural system, that is two or more rows high and that is not a *building element*. See "Grandstand".

BUILDING ELEMENT. A functional component of building construction that is listed in Table 601 of the *International Building Code*. Such components are constructed of materials consistent with the construction type of the building and can be fire-resistance-rated.

COMMUTER PARKING LOT. Parking designated specifically for the temporary storage of personal vehicles at or near the workplace or at a location from where an employee commutes to work by transit, vanpooling or carpools.

GRANDSTAND. Tiered seating that is supported on a dedicated structural system, that is two or more rows high and that is not a *building element*. See "Bleachers".

DEVELOPED LINEAR PARK. A park that is longer than wide, often formed as a part of a system of trails that are made of materials that provide a stable and firm surface.

MARINAS. A facility for personally owned sailboats and yachts, typically offering docking, fuel, off-season out-of-water storage and other services; sometimes with a restaurant.

ORGANIZED CAMP. A site with program and facilities established for the primary purposes of providing an outdoor group living experience with social, spiritual, educational, or recreational objectives, for five days or more during one or more seasons of the year.

PICNIC AREA. A tract of land set aside within a park that contains tables and cooking equipment for the purposes of eating outdoors.

PUBLIC BEACH. A public beach is any beach, whether publicly or privately owned, extending inland from the line of mean low tide to the natural line of vegetation to which the public has acquired the right of use. This definition does not include a beach that is not accessible by means of public transportation such as roads and ferries.

PUBLIC SWIMMING POOL. A pool, other than a residential pool, that is intended to be used for swimming or bathing and is operated by an owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for use.

RIDING ARENAS. Buildings used for boarding, breeding and training of horses, riding instruction and competitions and that have an occupant load of less than 200.

Revise as follows:

403.1 (IBC [P]2902.1)Minimum number of fixtures. Plumbing fixtures shall be provided ~~for~~ in accordance with ~~the type of *occupancy* and in the minimum number shown in per~~ Table 403.1.1 or Table

403.1.2. ~~Types of occupancies not shown in Table 403.1 shall be considered individually by the code official.~~ The number of occupants and occupancy classification shall be determined by the International Building Code. ~~Occupancy classification shall be determined in accordance with the International Building Code.~~ Those groups which are accessory to the main use group shall be provided with fixtures in accordance with the main use group classification.

Types of ~~occupancies~~ uses not shown in Table 403.1.1 or Table 403.1.2 shall be considered individually by the code official.

TABLE 403.1.1 (IBC [P]2902.1.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES BASED ON USE GROUP CLASSIFICATION
(See Sections 403.2 and 403.3)

(Portions of table not shown remain unchanged)

TABLE 403.1.2 (IBC [P]2902.1.2)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

TYPE OF BUILDING OR USE	WATER CLOSETS		LAVATORIES	BATHTUB/ SHOWER	DRINKING FOUNTAIN
	MALE	FEMALE			
Picnic areas	1 per 50		1 for every 2 water closets		
Organized camps	1 per 15		1 per 15	1 per 150	1 per camping area
Public swimming pools[b]	1 per 125[a]	1 per 75	1 for every 2 water closets	1 per 200	1 per 1,000
Developed linear parks and trails[c](ARA)	1 per each 3.1 miles (5 km) interval		1 for every water closet	--	--
Athletic fields[e,f]	1 per 75	1 per 40	1 for every 2 water closets	--	1 per 1,000[g]
Marinas	1 per 100 slips		1 for every 2 water closets	--	--
Commuter parking lots[d]	1 per 100 parking stalls		1 for every 2 water closets	--	--
Public beaches	1 per 100		1 for every 2 water closets	--	--
Riding arenas	1 per 100		1 for every 2 water closets	--	--

a. Urinals shall be permitted to be substituted for not more than 67 percent of the required number of water closets.
b. Where the occupant load is less than 15, one family or assisted use toilet facility shall be permitted to be substituted for separate male/female toilet facilities. Where the occupant load is less than 50, two family or assisted use toilet facilities shall be permitted to be substituted for separate male/female toilet facilities..
c. Separate facilities shall not be required where one or more family or assisted use toilet facilities is provided.
d. Where the parking lot capacity is less than 10 vehicles, fixtures shall not be required.
e. Facilities shall be within 500 feet of field perimeter.
f. Where the total bleacher or grandstand seating capacity is less than 150 persons and permanent toilet facilities are not provided, portable toilets facilities that conform to ANSI 4.3 shall be provided.
g. Where the total bleacher or grandstand seating capacity is less than 150 persons, drinking fountains shall not be required.

Reason: While the language in 403.1 provides discretion to the code official to determine the "best fit" for occupancies not shown in Table 403.1, there are situations where it just does not "fit" into the Table. The proposed table is to provide additional direction to the code official for situations that are not defined in Table 403.1 yet should be provided with fixtures and at a lower rate than those defined in Table 403.1 due to their infrequent usage.

Many of the proposed required fixtures exist in other codes, some of which have modified the IPC at the state or local level to provide direction to their respective jurisdictions. Other uses have been added to reflect growing trends in parks and transportation (ride sharing areas).

The proposed fixtures are intended to be permanent in nature, not portable facilities. While there is a footnote providing an exception to allow for portable facilities in one use, the enforcement of providing and maintaining portable facilities is not feasible in many jurisdictions due to recent economic problems resulting in doing more with less.

Cost Impact: The code change proposal will increase the cost of construction.

P27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.1-P-OLIPHANT

P28 – 12

Table 403.1 (IBC Table [P]2902.1)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2) MALE	WATER CLOSETS (URINALS SEE SECTION 419.2) FEMALE	LAVATORIES MALE	LAVATORIES FEMALE	BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[e, f] (SEE SECTION 410.1)	OTHER
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses.[j]	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[g]

j. Exam and procedure rooms in doctor, dentist and veterinarian offices shall be provided with a hand washing sink.

(Portions of table and footnotes not shown remain unchanged)

Reason: The code is silent about requiring hand washing sinks in doctor, dentist and veterinarian exam and procedures rooms. Sanitation is vitally important to prevent the spread of disease causing organisms. Hand washing is critical in preventing this spreading. The code needs to require hand washing sinks in these areas to allow for proper sanitation.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.1-P-STRAUSBAUGH.PMGCAC

P29 – 12
202 (IBC 202), Table 403.1 (IBC Table [P]2902.1)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new definitions as follows:
(Definitions to also be added to the IBC)

GRANDSTAND. Tiered seating that is supported on a dedicated structural system, that is two or more rows high and that is not a *building element*. See "Bleachers".

BLEACHERS. Tiered seating that is supported on a dedicated structural system, that is two or more rows high and that is not a *building element*. See "Grandstand".

BUILDING ELEMENT. A functional component of building construction that is listed in Table 601 of the IBC. Such components are constructed of materials consistent with the construction type of the building and can be fire-resistance-rated.

Revise table as follows:

TABLE 403.1 (IBC Table [P]2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[e, f] (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly	A-5	Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[h]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000[i]	1 service sink[i]

(Portions of table and footnotes not shown are unchanged)

h. Where the total *bleacher* or *grandstand* seating capacity is less than 150 persons and permanent toilet facilities are not provided, portable toilets facilities that conform to ANSI 4.3 shall be provided.
i. Where the total *bleacher* or *grandstand* seating capacity is less than 150 persons, drinking fountains and service sinks shall not be required.

Reason: Consider a small city park with a ball field having a several bleacher units. The code currently requires that any venue with bleachers and grandstands have permanent toilet facilities and a drinking fountain and a service sink. This seems to be an unreasonable requirement where the ball field is used only seasonally, the anticipated attendance is very low and the provision of utilities (water, sewer) might be difficult. However, it is recognized that the presence of even a small number of people at an event does create the need for basic toilet facilities. Therefore, if permanent toilet facilities are not required, then portable toilet facilities need to be required.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.1 #2-P-STRAUSBAUGH.PMGCAC

P30 – 12
Table 403.1 (IBC [P]2902.1), 410.2 (New) (IBC 2902.6 (New))

Proponent: Matt Archer - Douglas County, CO - representing the Colorado Chapter ICC (marcher@douglas.co.us)

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]

(See Sections 403.2 and 403.3)

BATHTUBS/ SHOWERS	DRINKING FOUNTAIN~~[e, f]~~ (SEE SECTION 410~~.1~~)	OTHER

(Portions of table not shown remain unchanged.)

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the International Building Code.
b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.
c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units hall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.
d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
~~e. The minimum number of required drinking fountains shall comply with Table 403.1 and Chapter 11 of the International Building Code.~~
~~f. Drinking fountains are not required for an occupant load of 15 or fewer.~~
~~g~~e. For business and mercantile occupancies with an occupant load of 15 or fewer, service sinks shall not be required.

410.2 (IBC 2902.6)Small occupancies. Drinking fountains shall not be required for an occupant load of 15 or fewer.

(Renumber subsequent section)

Reason: I believe footnotes serve as a guide for how to use the table. Footnotes are not meant to create new requirements or exceptions.

I deleted footnote e because the table will refer you to the main Section 410 where the (existing) section 410.2 stating that 2 drinking fountains are required for accessibility reasons can be found. Therefore, footnote e will be redundant and should be removed.

I deleted footnote f because this footnote applies to the entire table and not a specific function within the table. Therefore, this type of exception should be placed in the body of the code by moving the footnote to a new section under Section 410, drinking fountains.

Cost Impact: None

P30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.1-ARCHER

P31 – 12
Table 403.1 (IBC [P]2902.1)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing InSinkErator (JBEngineer@aol.com)

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS		LAVATORIES		BATHTUBS / SHOWERS	DRINKING FOUNTAINS	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly	A-2	Restaurants, banquet halls and food courts	1 per 75	1 per 75	1 per 200		-	1 per 500	1 service sink, 1 food waste grinder

Reason: Food waste grinders are an important component of every commercial kitchen and food handling establishment. This change will merely emphasize that such an appliance is required for these establishments. Plumbing engineers already provide food waste grinders in the design of commercial kitchens. Hence, this is not a significant change since it is common practice to install a food waste grinder.

It is well known as to the purpose of a food waste grinder. By having a food waste grinder in a commercial kitchen, there will be a reduction in the number of stoppages, since food waste will be reduced in size to allow the water to transport the food waste to the public sewer.

Cost Impact: This change will increase the cost of construction.

P31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.1-P-BALLANCO

P32 – 12
Table 403.1 (IBC Table [P]2902.1)

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan representing The Bureau of Construction Codes. (konyndykr@michigan.gov)

Revise as follows:

TABLE 403.1 (IBC Table [P]2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[e, f] (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			

h. Structures not designed for occupants or as an employee's regular working area shall not be required to have toilet facilities.

(Portions of table and footnotes not shown remain unchanged.)

Reason: This code change revision will improve the code by providing greater clarity. This footnote clarification provides a restroom exception for structures like very small remote metering stations, unattended airplane hangers, etcetera. For example it is understood that Number 8, Classification Storage, Occupancy S-1 and S-2 in the table above address structures where individuals are present.

Cost Impact: Construction cost will be reduced by providing greater understanding of non occupied structures.

P32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.1-P-KONYNDYK

P33 – 12
Table 403.1 (IBC [P]Table 2902.1)

Proponent: Gary Kreutziger,M.C.P., City of San Antonio, representing himself (gkreutziger@sanantonio.gov)

Revise as follows:

TABLE 403.1 (IBC [P]Table 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]

(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[e, f] (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			

f. Drinking fountains are not required for an occupant load of 15 or fewer <u>or in clinic, outpatient occupancies as defined in the *International Building Code*.</u>

(Portions of table and footnotes not shown remain unchanged.)

Reason: The installation of a drinking fountain in *clinic, outpatient* occupancies is an obstacle in a clinics ability to maintain sanitary conditions and infection control within the medical office. Per the Center for Disease Control, indirect transmisssion of infectious diseases can occur by contact of an infectious agent through a contaminated intermediate object and some viruses and bacteria can live two hours or longer on most surfaces. Also most clinical staff would prefer to control the distribution of drinking water due to patients not being allowed any food or drink prior to a procedure.

Cost Impact: The code change proposal will not increase the cost of construction.

P33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.1-P-KREUTZIGER

P34 – 12
403.2 (IBC [P] 2902.2)

Proponent: David Porter AIA, representing David Porter Associates and self.
(dporter@porterarchitects.com)

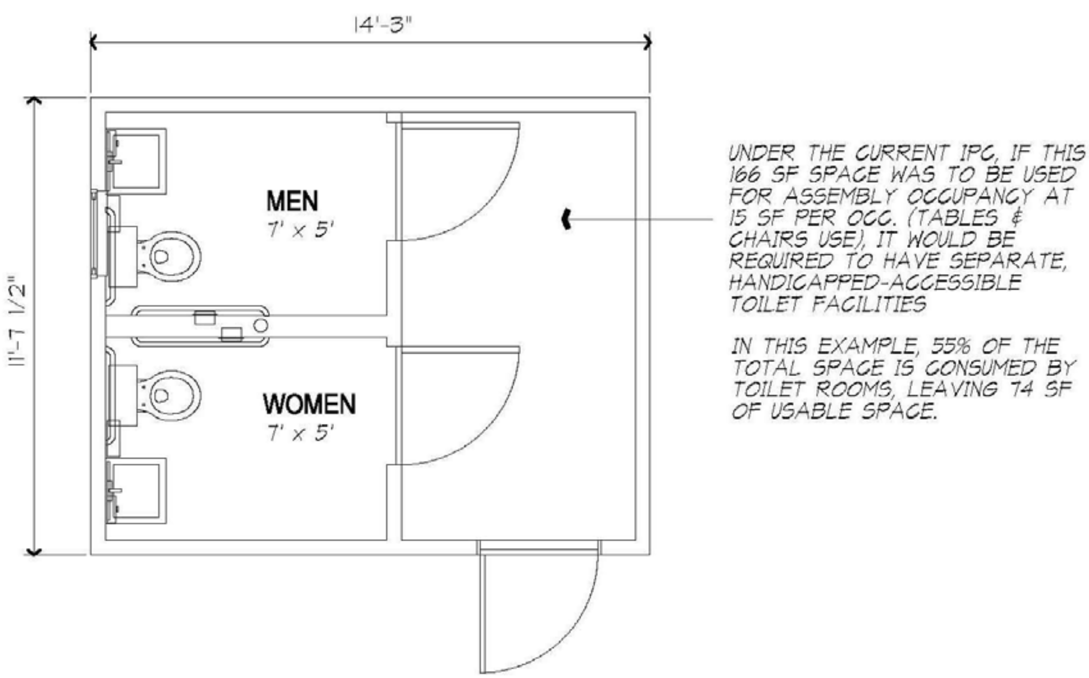
Revise as follows:

403.2 (IBC [P] 2902.2) Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for
each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or fewer.
4. <u>Separate facilities shall not be required in assembly occupancies in which the maximum occupant load is 50 or fewer.</u>

Reason: There is no current exception for allowing a single toilet room in very small assembly occupancies. One could conceivably have a 100 SF, small community hall where the occupant load would be 7 persons (15 SF per occupant for table and chair seating) but where two, separate, handicapped-accessible toilet rooms are currently required. Those two toilet rooms would consume no less than 70 SF of the 100 SF space and that does not seem to be the intent of the Code (see attached illustrative example of the current code requirement).



Cost Impact: The code change proposal will not increase the cost of construction.

P34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.2-P-PORTER

P35 – 12
403.3 (IBC [P] 2902.3)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing Little Caesar Enterprises (JBEngineer@aol.com)

Revise as follows:

403.3 (IBC [P] 2902.3) Required public toilet facilities. Customers, patrons and visitors shall be provided with *public* toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 403 for all users. Employees shall be provided with toilet facilities in all *occupancies*. Employee toilet facilities shall be either separate or combined employee and *public* toilet facilities.

Exceptions: Public toilet facilities shall not be required in<u>:</u>

<u>1.</u> Open or enclosed parking garages~~. Toilet facilities shall not be required in parking garages~~ where there are no parking attendants.
<u>2.</u> <u>Structures and tenant spaces intended for quick transactions, including take out, pick up and drop off, having a public access area less than or equal to 300 square feet.</u>

Reason: Tenant spaces that are only intended for quick transactions do not need to provide public facilities for customers, patrons, and visitors. The public does not rely on such spaces to provide public toilet rooms. Patrons spend a short period of time completing a transaction, then they depart.

Examples of these types of spaces include: take out food locations, such as Chinese food take outs; pizza take outs; and carry out ribs. Similar quick transaction facilities include: dry cleaners, atm facilities, florists, shoe repair shops, and newspaper stands.

It is recognized that the text of the second exception could be shortened to read: <u>Structures and tenant spaces having a public access area less than or equal to 300 square feet.</u> The added text is provided for clarity.

The purpose of this section has always been to provide comfort facilities for anyone spending a period of time in the public space. Quick transaction spaces are unique, in that people are not in the space for any length of time. Furthermore, the space open to the public is limited to 300 square feet.

It would be a safety and/or health hazard to have the public travel to the working areas of the tenant space to use toilet facilities. Hence, if a public toilet room is added, the space for the toilet room would have to be located in the front space where the small public area is located. This creates a security concern where the public toilet room would block openings in the front tenant space.

The 300 square foot dimension is based on the standard large spaces used by these types of facilities. Most tenant spaces of this type have an area less than 300 square feet for the public.

Cost Impact: This change does not increase the cost of construction.

P35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.3-P-BALLANCO

P36 – 12
403.3.1 (IBC [P] 2902.3.1)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee, the Virginia Plumbing and Mechanical Inspectors Association (VPMIA), the Virginia Building Code Officials Association (VBCOA) and ICC Region 7.

Revise as follows:

403.3.1 (IBC [P] 2902.3.1) Location and access. The required public toilet facilities shall be located in the same building or in an adjacent building that is under the same tenant control. Access to the required facilities shall be from within the building or from the exterior of the building. ~~All~~ Access routes shall comply with the accessibility requirements of the *International Building Code*. The access route to ~~the~~ *public* toilet facilities ~~required by Section 403.3~~ shall not pass through kitchens, storage rooms or closets. The public shall have access to the required toilet facilities at all times that the building is occupied.

Reason: Access to toilet facilities can be from the exterior of a building and facilities for one building can be located in another building given that the required travel distance is met and it's an accessible route. This proposal ensures that the tenant that is required to provide facilities is actually authorized to use toilets in another area during all times that such tenant space is occupied. The current problem is that some creative designs have attempted to utilize facilities where the tenant has absolutely no control over the location of the non-local facilities. Concerning the second line: If access to toilet facilities can be from the exterior of a building, could toilet facilities for one building be located in another building given that the required travel distance is met?

Examples: Could amusement park buildings have central toilet facilities in one building to serve the requirements of those buildings? Could a business office building with an adjacent working warehouse building have the toilet facilities for the warehouse in the office building?

For example, a strip center type mall setting may have an adjacent retail building. The tenants in the mall might expect their customers to use the facilities in the adjacent building, so long as they are not more than 500 feet away and on an accessible route. This proposal prevents that from occurring if the adjacent retail building is not under the same "tenant control." This example creates two serious problems. The first is the retail building owner may not be aware that he is the facility provider for spaces in the strip mall. In addition there is no way to regulate or mandate the hours of operation for the adjacent building to coincide with those of the strip mall. The second is what if the adjacent building operation goes out of business? There are many examples of campus type properties and outlet mall complexes where the required toilet facilities are in another building and this should be allowed if access to such buildings is controlled such that the facilities will always be available when needed.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P36-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.3.1-P-STRAUSBAUGH.PMGCAC

P37–12
403.3.6 (IBC [P]2902.3.5)

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself (randy.dahmen@wi.gov)

Revise as follows:

403.3.6 (IBC [P]2902.3.5) Door locking. ~~Where a toilet room is provided for the use of multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet rooms.~~ Doors to toilet rooms shall not be lockable from either side of the door.

Exceptions:

1. Toilet room doors located on the exterior of a building that are associated with a motor fuel-dispensing facility shall be permitted to be lockable from the exterior provided that the key for access is available from a building attendant. When an attendant is not present, such toilet rooms can be locked from the exterior.
2. The doors to family-or-assisted-use toilet rooms and toilet rooms designed for a single occupant shall be permitted to have a lock on the inside of the door.

Reason: The proposed language addresses the limitations for access to toilet rooms not currently addressed in the code. Motor fuel-dispensing facilities many times will have toilet rooms that are accessible from the exterior of the building. These facilities many times require a key for access to be obtained from the building attendant. At present, there are many such facilities that remain limitedly open by allowing fuel dispensing to take place under an attached canopy by a customer, when there are no longer workers located in the main building. The proposed language is to clarify when toilet rooms for these type of buildings are expected to available for use. The 2nd exception is included so as to address previous code language.

Cost Impact: The code change proposal will not increase the cost of construction.

P37-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.3.6 (NEW)-P-DAHMEN

P38 – 12
403.4 (IBC [P]2902.4)

Proponent: Larry Brown, National Association of Home Builders (NAHB)

Revise as follows:

403.4 (IBC [P]2902.4)Signage. Required public facilities shall be provided with ~~designated by a legible~~ signs that ~~for each~~ designate the sex as required by Section 403.2. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with Section 1110 of the *International Building Code*.

Reason: This modification is proposed as the IPC and IBC do not always require a separate toilet facility for each sex, as shown below in the Exceptions to Section 403.2. As Section 2902.4 (above) only addresses the signs themselves, is it more appropriate that sign itself have the correct designation for the sex, or for a facility that can be used by either sex. This modification achieves this intent.

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or fewer.

Cost Impact: The code change proposal will not increase the cost of construction.

P38-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.4-P-BROWN

P39 – 12
403.4.1 (IBC [P] 2902.4.1)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

403.4.1 (IBC [P] 2902.4.1) Directional signage. Directional signage indicating the route to the required public toilet facilities shall be posted ~~in accordance with Section 3107 of the *International Building Code*. Such signage shall be located~~ in a lobby, corridor, ~~or~~ aisle or similar space, such that it can be readily seen from the main ~~at the~~ entrance to the building or tenant space. ~~facilities for customers, and visitors~~.

Reason: IBC Section 3107 is silent with respect to the posting of this directional signage, so the reference to this section is being removed. The current language indicates that that signage should be located at the entrance to the toilet facilities. The intent of this section is to require signage at the entrance of the building or tenant space so that persons entering such spaces are made aware that toilet facilities do exist and the general direction to those facilities. The overall reason why this section is in the code is to prevent the tenant from telling people that toilet facilities are not available. The requirement for a sign to be displayed at the entrance to the building or tenant space puts the tenant on notice that he cannot deny that public toilet facilities exist to those persons needing those facilities. How can the tenant or owner say that he/she has no public toilet facilities when there is a sign clearly indicating the location of those supposedly non-existing facilities?

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P39-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.4.1-P-STRAUSBAUGH.PMGCAC

P40– 12
404.1, Chapter 14

Proponent: Sidney L. Cavanaugh, Cavanaugh Consulting representing Truebro (sidneycavanaugh@yahoo.com)

Revise as follows:

404.1 Where required. Accessible plumbing facilities and fixtures shall be provided in accordance with the International Building Code. Where accessible plumbing facilities or fixtures are required, such facilities and fixtures shall comply with ICC A117.1. Exposed waste and supplies on such fixtures shall be protected and insulated in accordance with ASME A112.18.9.

Add new standards to Chapter 14 as follows:

ASME

A112.18.9-2011	Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures.

ICC

A117.1-2009	Standard for Accessible and Usable Buildings and Facilities for Persons with Physical Disabilities

Reason: The completion of the national consensus standard for protectors/insulators for exposed waste and supplies which are required by ANSI/ICC A117.1 allows for compliance with that standard and consistent installation and protection in the field. In addition, plumbing fixtures and fittings and their inspection are under the jurisdiction of the plumbing inspector, including accessible ones. Accordingly the ANCI/ICC standard should be referenced in the plumbing code.

Cost Impact: No additional cost

P40-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.1-CAVANAUGH

P41 – 12
404.1.1 (New), Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Add new text as follows:

<u>**404.1.1 Exposed Pipes and Surfaces.** Water supply and drain pipes under accessible lavatories and sinks shall be insulated/protected by covers complying with ASME A112.18.9.</u>

Add new standard to Chapter 14 as follows:

ASME
<u>A112.18.9–2011</u> <u>Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures</u>

Reason: ASME A112.18.9 Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures is a National standard (ANSI). This Standard is intended to cover products that will satisfy the requirements of ICC/ANSI A117.1, Standard for Accessible and Usable Buildings and Facilities for Persons With Physical Disabilities, and contains acceptable performance requirements for protectors/insulators for exposed waste and supplies, so a physically challenged person will be protected when using a sink or lavatory in a public/commercial or private/residential facility.

Cost Impact: The code change proposal will not increase the cost of construction.

P41-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.1.1 (NEW)-CONSTANTINO

P42 – 12
404.2 (New), 404.3 (New), Chapter 14

Proponent: Julius Ballanco, P.E./JB Engineering and Code Consulting, P.C. representing McGuire Manufacturing (JBEngineer@aol.com)

Add new text as follows:

<u>**404.2 Accessible fixture requirements.** Accessible plumbing fixtures shall be installed with the clearance, height, spacing, and arrangement in accordance with ICC A117.1.</u>

<u>**404.3 Exposed pipes and surfaces.** Water supply and drain pipes under accessible lavatories and sinks shall be covered or otherwise configured to protect against contact . Pipe coverings shall comply with ASME A112.18.9.</u>

Add new standards to Chapter 14 as follows:

ASME
<u>A112.18.9-2011</u> <u>Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures</u>

ICC
<u>A117.1-2009</u> <u>Accessible and Usable Buildings and Facilities</u>

Reason: Reference should be made to ICC A117.1 in the plumbing code. While this standard is referenced in the Building Code, it should also be referenced in the Plumbing Code since the standard contains requirements for plumbing fixture installations.

One of the common concerns is who inspects accessible plumbing fixtures for compliance with ICC A117.1? Plumbing fixtures are inspected by the plumbing official. Therefore, appropriate reference to the spacing, sizing, and configuration requirements needs to be placed in the plumbing code.

ASME A112.18.9 Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures is the national consensus standard regulating protective covers for water and drain pipes. This Standard is intended to regulate products that must meet the requirements of ICC A117.1. The standard has performance requirements for protectors/insulators for exposed waste and supplies, so a physically challenged person will be protected when using a sink or lavatory in a public/commercial or private/residential facility.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.18.9-2011 and ICC A117.1-2009, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.2-P-BALLANCO

P43 – 12
405.10 (New)

Proponent: Daniel D. Fish, Roda LLC,representing self (info@drainbrain.us)

Add new text as follows:

405.10 Wastewater leak containment, detection and notification. Where a plumbing fixture such as a water closet, shower, or bathtub is installed in a location where wastewater leakage from the fixture will cause damage, an early-warning wastewater leak containment, detection, and notification device shall be required. This device shall be equipped with an auditory alarm, visual signal, and a means for notification to the affected building occupants, property owners or the property management staff. The auditory alarm shall have a sound pressure level rating of not less than 85 dB when measured at a distance of ten feet.

Reason: Millions of wastewater leaks occur every year in multi-story buildings from leaking drains, waste lines, and toilets. Toilets are especially high risks for water leakage. Research has shown that 30 percent of all toilets in the United States leak. Toilets with unreliable wax gaskets and flanges – a common problem – cause the most damage to the unit below. Also, the float valve that controls water entering the toilet tank often malfunction, which allows water to run into toilet waste line continuously .

Wastewater leaks typically go undetected until considerable damage has been done. These leaks: (1) waste millions of gallons of water, (2) damage property/materials, generating millions of tons of debris that swells landfills, and (3) develop mold on building components, creating property damage and a health hazard. Property owners spend millions of dollars to repair the damage from wastewater leaks and cure mold-related problems.

An early-warning wastewater leak containment, detection, and notification device will give building occupants and owners the opportunity to avoid wastewater leak damage and its attendant costs. Taking action early will conserve millions of gallons of water and eliminate the environmental, economic, and health hazards from wastewater leaks. This solution for the age-old wastewater leak problem will meet the intent of this code by safeguarding the public health, safety, and welfare.

Cost Impact: The code change proposal will not increase the cost of construction.

P43-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

405.10 (NEW)-P-FISH

P44– 12
405.3.1

Proponent: Bob Scott, Kye Lehr and Daryl Kuiper - Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

405.3.1 Water Closets, urinals, lavatories and bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches from its center to any side wall, partition, vanity, <u>paper holder, accessory</u> or other obstruction, or closer than 30 inches (762mm) center to center between adjacent fixtures. There shall be a 21 inch clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall be not less than 30 inches (762mm) in width and not less than 60 inches (1524 mm) in depth for floor mounted water closets and not less than 30 inches(762mm) in width and 56 inches (1422 m) in depth for wall-hung water closets.

Reason: Today's construction is typically limited to the minimums permitted in this section. Once tissue holders, napkin disposals and paper dispensers are installed this min area is reduced to a non- practical size when located adjacent to the fixture. Adding the language proposed would require installers to take into consideration these types of obstructions and locate them in front of the fixture where usage of the fixture is not compromised.

Cost Impact: none. The practice of locating accessories in front of the fixture instead of adjacent to it would cause no additional labor or costs.

P44-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

405.3.1-P-SCOTT

P45 – 12
405.3.2

Proponent: Shawn Strausbaugh, Arlington County VA Representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Revise as follows:

405.3.2 Public lavatories. In employee and *public* toilet rooms, the required lavatory shall be located in the same room as the water closet.

> <u>**Exception:** In educational use occupancies, the required lavatory shall be permitted to be located adjacent to the room or space containing the water closet provided that not more than one operational door is between the water closet and the lavatory.</u>

Reason: This has been a long standing practice in school construction. It is geared towards helping educate children on the importance of personal hygiene. This arrangement also allows for group wash fixtures to be located adjacent to core toilet rooms. This allows the instructors to wait outside and assure the children wash their hands upon exit of the toilet room. More commonly, it permits the installation of the lavatory to be located within the classroom when water closets are installed in the classroom itself. So when a child uses the facilities they walk through a single door (no different in concept to exiting a typical toilet stall) into the classroom where the instructor can assure hands are washed.

Cost Impact: None

P45-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

405.3.2-P-STRAUSBAUGH

P46 – 12
406.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

406.1 Water connection. The water supply to an automatic clothes washer shall be protected against backflow by an air gap that is integral with ~~installed~~ ~~integrally within~~ the machine or ~~with the installation of~~ a backflow preventer shall be installed in accordance with Section 608. Air gaps shall comply with ASME A112.1.3 or A112.1.2.

Reason: The requirement for automatic clothes washing machines to comply with ASSE 1007 (covering the requirement for an internal air gap on the water supply) was removed from the 2012 code because ACW manufacturers are no longer certifying their machines to ASSE 1007. Standards that they do comply with, ASME A112.1.3 or A112.1.2 are being included in this section so that inspectors are able to verify that the ACW's have integral backflow protection.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P46-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.1-P-STRAUSBAUGH.PMGCAC

P47 – 12
406.2

Proponent: Richard Allison, A.R.K. Plumbing, Inc, representing self

Revise as follows:

406.2 Waste connection. The waste from an automatic clothes washer shall discharge through an air break into a standpipe in accordance with Section 802.4 or into a laundry sink. The trap and fixture drain for an automatic clothes washer standpipe shall be not less than 2 inches (51 mm) in diameter. ~~The fixture drain for the standpipe serving an automatic clothes washer shall connect to a 3-inch (76 mm) or larger diameter fixture *branch* or *stack*.~~ Automatic clothes washers that discharge by gravity shall be permitted to drain to a waste receptor or an approved trench drain.

Reason: Certain jurisdictions are interpreting this as needing a 3 inch fixture branch solely for automatic clothes washer. Their interpretation of this is that we need to use a 3 x 1 ½ x 2 sanitary tee and cannot wet vent the automatic clothes washer with a laundry tub. All other jurisdictions only require us to tie into a 3 inch stack.

Cost Impact: Minimal- More importantly on the cost, is in many instances, the framing won't allow this.

P47-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.2-P-ALLISON

P48 – 12
406.3 (New), Chapter 14

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Add new text as follows:

406.3 Approval. Commercial clothes washers shall be listed and labeled in accordance with UL1206 or UL 2157. Residential clothes washers shall be listed and labeled in accordance with UL 2157.

Add new standards to Chapter 14 as follows:

UL

1206-2003 (R2007)	Electric Commercial Clothes-Washing Equipment with revisions through June 16, 2010
2157-2004 (R2010)	Electric Clothes Washing Machines and Extractors

Reason: Referenced UL standards contain important safety and plumbing requirements that should be covered in the International Plumbing Code. UL 1206 and UL 2157 are ANSI approved standards for commercial clothes washing equipment. UL 2157 is an ANSI approved standard for domestic clothes washers.

Cost Impact: None

Analysis: A review of the standards proposed for inclusion in the code, UL 1206-2003(R2007) and UL 2157-2004(R2010) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.3-P-EUGENE

P49 – 12
409.1, Chapter 14

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

409.1 Approval. Commercial dishwashing machines shall conform to ASSE 1004 and NSF 3. Commercial dishwashing machines shall be listed and labeled in accordance with UL 921. Residential Dishwashing machines shall be listed and labeled in accordance with UL 749.

Add new standards to Chapter 14 as follows:

UL

749-2008	Household Dishwashers
921-2005 (R2010)	Commercial Dishwashers

Reason: Referenced UL standards contain important safety and plumbing requirements that should be covered in the International Plumbing Code. UL 749 is an ANSI approved standard for household dishwashers. UL 921 is an ANSI approved standard for commercial dishwashers.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, UL 749-2008 and UL 921-2005 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

409.1-P-EUGENE

P50 – 12
409.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

409.2 Water connection. The water supply to a dishwashing machine shall be protected against backflow by an *air gap* that is integral with the machine or a backflow preventer shall be installed in accordance with Section 608. Air gaps shall comply with ASME A112.1.3 or A112.1.2.

Reason: The requirement for dishwashing machines to comply with ASSE 1006 (covering the requirement for an internal air gap on the water supply) was removed from the 2012 code because DW manufacturers are no longer certifying their machines to ASSE 1006. Standards that they do comply with, ASME A112.1.3 or A112.1.2 are being included in this section so that inspectors are able to verify that the DWM's have integral backflow protection.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P50-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

409.2-P-STRAUSBAUGH.PMGCAC

P51 – 12
410.1, Chapter 14

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1/CSA B45.2 or ASME A112.19.2/CSA B45.1 and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. Electrically operated, refrigerated drinking water coolers shall be listed and labeled in accordance with UL 399.

Add new standard to Chapter 14 as follows:

UL
399-2008 Drinking-Water Coolers, with revisions through January 14, 2011

Reason: Referenced UL standards contain important safety and plumbing requirements that should be covered in the International Plumbing Code. UL 399 is an ANSI approved standard for drinking water coolers.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, UL 399-2008 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P51-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.1-P-EUGENE

P52 – 12
410.1, 410.3, 410.4, Chapter 14

Proponent: Len Swatkowski representing Plumbing Manufacturers International (lswatkowski@pmihome.org)

Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1/CSA B45.2, ~~or~~ ASME A112.19.2/CSA B45.1 or ASME A112.19.3/CSA B45.4. Drinking fountains with self-contained refrigeration units for chilling the drinking water ~~and water coolers~~ shall also conform to ~~ARI 1010~~ ASHRAE Standard 18. Drinking fountains ~~and water coolers~~ shall conform to NSF 61, Section 9.

410.3 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies, where drinking fountains are required, ~~water coolers~~ permanently-installed bottle filling stations ~~or bottled water dispensers~~ shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains. Bottle filling stations shall conform to NSF 61. Where bottle filling stations have self-contained refrigeration units for chilling the drinking water, they shall conform to ASHRAE Standard 18. Bottled water dispensers shall not be substituted for required drinking fountains.

410.4 Prohibited location. Drinking fountains and bottle filling stations~~,~~ ~~water coolers~~ ~~and bottle water dispensers~~ shall not be installed in public restrooms.

Add new standard to Chapter 14 as follows:

American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, NE
Atlanta, GA 30329

ASHRAE

Standard 18-2008	Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration

Reason: There is considerable confusion in the code enforcement and design communities about terminology for drinking fountains. Currently the Section 410.1 talks about drinking fountains and water coolers. Drinking fountain manufacturers use the term “water cooler” to indicate a drinking fountain that supplies chilled drinking water. However, for years, many people have thought of water coolers as the water dispensers that have a 5 gallon water bottle turned upside down on top of them. Because the code uses the term “water cooler” in Section 410.1, some misunderstand that the code allows for a complete substitution of drinking fountains with bottled water dispensers. This is not the intent of the code nor would we want these “temporary” water dispensers to be the only source of drinking water in a building. My proposed changes eliminate the term “water cooler” to prevent future misunderstanding of what is allowed and what is not.

The substitution of bottled water dispensers for a *required* number of drinking fountains is often used to “get around the code requirement” for providing the full number of required permanent fixtures for providing drinking water. It is not uncommon for bottled water dispensers to frequently run dry, for cups not to be available or for management to realize how much they end up paying for the bottled water service and discontinue the service. Ultimately, the intent of the code is not being realized in many buildings. Because of the temporary nature of bottled water dispensers, they should not be allowed to be a substitute for permanent fixtures.

There is no denying that the use of personal drinking water bottles has increased dramatically in recent years. Use of a personal water bottle eliminates having to obtain drinking water from a drinking fountain that might not have been cleaned for some time. Some people just don’t like the idea of putting their mouth so close to an area where others have done so previously. Getting water from a lavatory in order to fill a water bottle is no better. So why not realize the trend towards personal water bottle use and have the code allow a bottle filling station substitution for drinking fountains? It is a permanent fixture, it provides access to a clean supply of drinking water, it encourages reuse of bottles (a green practice), reduces the carbon footprint of bottled water delivery (a very green practice) and provides drinking water in a manner that the public is demanding more and more. It’s time for the code to come out of the dark ages and provide complete access to safe drinking water.

And finally, the ASHRAE 18 standard is being proposed to replace the AHRI 1010 standard that has not be used for many years for water cooling systems. AHRI no longer maintains the standard (the last revision was 10 years ago). The code needs to stay abreast of current standards.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE Standard 18-2008, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P52-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.1-P-SWATKOWSKI

P53 – 12
202, 410.1, 410.3, 410.4, Chapter 14

Proponent: John Watson, Manager-Compliance and Sustainability, Elkay Manufacturing, representing Elkay Manufacturing (john.watson@elkay.com)

Add new definitions as follows:

BOTTLE FILLING STATION. A plumbing fixture that is connected to the potable water distribution and building drainage system and is designed and intended for filling personal use drinking water bottles not less than 10 inches (250 mm) in height. Such fixtures can be separate from or integral to a *drinking fountain*.

DRINKING FOUNTAIN. A plumbing fixture connected to the potable water distribution system that provides drinking water in a flowing stream so that the user can consume water directly from the fixture without the use of any accessories. Drinking fountains can incorporate a *bottle filling station*. Wasted water from the flowing stream and from the *bottle filling station* is captured and directed into the building's drainage system. These fixtures have a permanent connection to a building's potable cold water supply and to the building's drainage system through a trap and can incorporate a water filter and a cooling system for chilling the drinking water.

Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1/CSA B45.2, ~~or~~ ASME A112.19.2/CSA B45.1 or ASME A112.19.3/CSA B45.4. Drinking fountains and *bottle filling stations* with a self contained cooling system for chilling the drinking water ~~and water coolers~~ shall conform to ~~ARI 1010~~ ASHRAE Standard 18. Drinking fountains and ~~water coolers~~ bottle filling stations shall conform to NSF 61, Section 9.

410.3 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies, where drinking fountains are required, *bottle filling stations* ~~water coolers or bottled water dispensers~~ shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains. Bottled water dispensers shall not be substituted for required drinking fountains.

410.4 Prohibited location. Drinking fountains and *bottle filling stations*~~, water coolers and bottle water dispensers~~ shall not be installed in public ~~restrooms~~ toilet facilities.

Add new standard to Chapter 14 as follows:

American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, NE
Atlanta, GA 30329

ASHRAE
Standard 18-2008 Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration

Reason: Drinking fountain manufacturers use the term "water cooler" to indicate a drinking fountain that supplies chilled drinking water. However, some people think of water coolers as the bottled water dispensers. My proposal eliminates the term "water cooler" to prevent future misunderstanding of what is allowed and what is not.

Using bottled water dispensers to substitute for a *required* number of permanently installed drinking fountains is just a cheap way for the designer to get around the full intent of the code. Providing permanent fixtures for obtaining drinking water is the intent of the code. Bottled water dispensers frequently run dry, cups for their use are sometimes not to be available and it's too easy for a bottled water service to be discontinued. Bottled water dispensers are temporary and should not be allowed to be a substitute for permanent fixtures.

We need to recognize that the use of personal drinking water bottles or containers has increased dramatically in recent years. Use of such a personal device eliminates having to obtain drinking water from a drinking fountain that might not have been cleaned for some time. Some people just don't like the idea of putting their mouth so close to an area where others have previously done so; and getting water from a lavatory in order to fill a water bottle is no better. So why not realize the trend towards personal water bottle use and have the code allow a bottle filling station substitution for drinking fountains? It is a permanent fixture, it provides access to a clean supply of drinking water, it encourages reuse of bottles (a green practice), reduces the carbon footprint of bottled water delivery (a very green practice) and provides drinking water in a manner that the public is obviously demanding. It's time for the code to recognize this new product and take a stance to provide complete access to safe drinking water.

And finally, the ASHRAE 18 standard is being proposed to replace the ARI 1010 standard that has not be used for many years for water cooling systems. ARI no longer maintains the standard (the last revision was 10 years ago). The code needs to stay abreast of current standards.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE Standard 18-2008, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P53-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.1-WATSON

P54 – 12
202, 410.3, 410.4

Proponent: Roger Harper, Jr, Louisa County VA, representing, the Virginia Plumbing and Mechanical Inspectors Association (sharper@louisa.org)

Add new definitions as follows:

DRINKING FOUNTAIN. A plumbing fixture that is connected to the potable water distribution system and the drainage system. The fixture allows the user to obtain a drink directly from a stream of flowing water without the use of any accessories.

WATER DISPENSER. A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. This definition also includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.

WATER COOLER. A drinking fountain that incorporates a means of reducing the temperature of the water supplied to it from the potable water distribution system.

Revise as follows:

410.3 Substitution. Where restaurants provide drinking water in a container free of charge, *drinking fountains* shall not be required in those restaurants. In other occupancies where *drinking fountains* are required, ~~water coolers or bottled~~ *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

410.4 Prohibited location. *Drinking fountains, water coolers* and ~~bottle~~ *water dispensers* shall not be installed in public restrooms.

Reason: There is often confusion regarding what is or is not a water cooler. Some people think that a water cooler is a drinking fountain since typically, they do also cool the water that is being dispensed. Others think that a water cooler is a bottled water dispenser that is capable of cooling the water dispensed. Currently the code does not define any of the terms. In reality, drinking fountains are drinking fountains and everything else is some form of a water dispenser. Whether or not the water is cooled is irrelevant. The code does not require cooled water. The code can be simplified in Section 410.3 by referring only to drinking fountains or their alternative, water dispensers. The new definitions establish that a drinking fountain and a water dispenser that is connected to the potable water supply system are both plumbing fixtures by definition and a bottled water dispenser is not a plumbing fixture by definition. It is necessary to be clear as to what the code requires to be provided and also what the code intends to allow as an alternative. This proposal also paves the way for new technology that is being marketed and installed today, namely water dispensers that are built into a wall, connected to the potable water supply system and dispense water into cups, glasses and bottles. These units typically treat the potable water with additional filtering and/or reverse osmosis treatment.

Cost Impact: none

P54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

410.3-P-HARPER

P55 – 12
412.5 (New)

Proponent: Joseph Campanella, representing self

Add new text as follows:

412.5 Floor drains required. Not less than one floor drain shall be installed in every kitchen and bathroom of a multi-story building.

Reason: Water from fire sprinkler activations, dishwasher overflows, and toilet overflows typically causes catastrophic damage to a building because there is nowhere for the water drain to except into the lower floors of a building. For high rise structures, this means that the water damage can extend for many floors below the floor where the water event occurred. This collateral damage is very costly for building owners and residents and could be prevented by the installation of floor drains in rooms where water catastrophes are most likely to occur. There would be significant cost savings on insurance premiums.

Cost Impact: The code change proposal will increase the cost of construction

P55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

412.5 (NEW)-P-CAMPANELLA

P56 – 12

413, 413.1, 413.2, 413.3, 413.4, Table 709.1, 802.1.6, 915.1, 916.1, 1003.3.2

Proponent: Julius Ballanco, P.E./ JB Engineering and Code Consulting, P.C. representing InSinkErator (JBEngineer@aol.com)

Revise as follows:

SECTION 413
FOOD WASTE DISPOSERS ~~GRINDER UNITS~~

413.1 Approval. Domestic food waste ~~grinders~~ disposers shall conform to ASSE 1008. Food waste ~~grinders~~ disposers shall not increase the drainage fixture unit load on the sanitary drainage system.

413.2 Domestic food waste ~~grinders~~ disposers waste outlets. Domestic food waste ~~grinders~~ disposers shall be connected to a drain of not less than 1 1/2 inches (38 mm) in diameter.

413.3 Commercial food waste ~~grinders~~ disposers waste outlets. Commercial food waste ~~grinders~~ disposers shall be connected to a drain not less than 1 1/2 inches (38 mm) in diameter. Commercial food waste ~~grinders~~ disposers shall be connected and trapped separately from any other fixtures or sink compartments.

413.4 Water supply required. All food waste ~~grinders~~ disposers shall be provided with a supply of cold water. The water supply shall be protected against backflow by an *air gap* or backflow preventer in accordance with Section 608.

Revise as follows:

TABLE 709.1
DRAINAGE FIXTURE UNITS FOR FIXTURES AND GROUPS

FIXTURE TYPE	DRAINAGE FIXTURE UNIT VALUE AS LOAD FACTORS	MINIMUM SIZE OF TRAP (inches)
Kitchen sink, domestic with food waste ~~grinder~~ disposer and/or dishwasher	2	1 ½

(Portions of table not shown remain unchanged.)

Revise as follows:

802.1.6 Domestic dishwashing machines. Domestic dishwashing machines shall discharge indirectly through an *air gap* or *air break* into a standpipe or waste receptor in accordance with Section 802.2, or discharge into a wye branch fitting on the tailpiece of the kitchen sink or the dishwasher connection of a food waste ~~grinder~~ disposer. The waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste ~~grinder~~ disposer shall connect to a deck-mounted *air gap* or the waste line shall rise and be securely fastened to the underside of the sink rim or counter.

Revise as follows:

915.1 Type of fixtures. A combination waste and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. Combination waste and vent systems shall not receive the discharge from a food waste ~~grinder~~ disposer or clinical sink.

916.1 Limitation. Island fixture venting shall not be permitted for fixtures other than sinks and lavatories. Residential kitchen sinks with a dishwasher waste connection, a food waste ~~grinder~~ disposer, or both, in combination with the kitchen sink waste, shall be permitted to be vented in accordance with this section.

Revise as follows:

1003.3.2 Food waste grinders. Where food waste ~~grinders~~ disposers connect to grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste ~~grinder~~ disposer. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste ~~grinder~~ disposer.

Reason: The proper term used in the plumbing profession is food waste disposers, not food waste grinders. This will correct the language in the code to the proper terminology for this type of plumbing appliance.

Cost Impact: This change does not increase the cost of construction.

P56-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

413-P-BALLANCO

P57 – 12
413.1, Chapter 14

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

413.1 Approval. Domestic food waste grinders shall conform to ASSE 1008 <u>and shall be listed and labeled in accordance with UL 430</u>. Food waste grinders shall not increase the drainage fixture unit load on the sanitary drainage system.

Add new standard to Chapter 14 as follows:

UL
<u>430-2009</u> <u>Waste Disposers, with revisions through March 23, 2011</u>

Reason: Referenced UL standards contain important safety and plumbing requirements that should be covered in the International Plumbing Code. UL 430 is an ANSI approved standard for waste disposers.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, UL 430-2009 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P57-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

413.1-P-EUGENE

P58 – 12
413.3

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing InSinkErator (JBEngineer@aol.com)

Revise as follows:

413.3 Commercial food waste grinder waste outlets. Commercial food waste grinders shall be connected to a drain not less than 11/2 inches (38 mm) in diameter. Commercial food waste grinders shall be connected and trapped separately from any other fixtures or sink compartments <u>and shall not discharge through a grease interceptor</u>.

Reason: This is a companion change to the change proposed to Section 1003. A food waste grinder should never discharge through a grease interceptor. The purpose of a food waste grinder is to pulverize food waste to small enough particles to discharge to the sewer. If a grinder connects to a grease interceptor, the food particles will separate out, defeating the purpose of a food waste grinder. Similarly, if a food waste grinder discharges to a solids interceptor, the food particles will be separated.

Cost Impact: This change does not increase the cost of construction.

P58-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

413.3-P-BALLANCO

P59 – 12
417.4.1

Proponent: Roger Harper, Jr, Louisa County VA, representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (sharper@louisa.org)

Revise as follows:

417.4.1 Wall area. Bathtub floors, shower floors, ~~the~~ wall areas above built-in tubs ~~with~~ that have installed shower heads and walls in shower compartments shall be constructed of smooth, ~~noncorrosive~~ corrosion-resistant and nonabsorbent waterproof materials. Wall materials shall extend to a height of not less than 6 feet (1829 mm) above the room floor level~~,~~ and not less than 70 inches (1778 mm) above the drain of the tub or shower. ~~where measured from the compartment floor at the drain.~~ Such walls shall form a water-tight joint with each other and with either the tub~~, receptor~~ or shower floor.

Reason: This is consistent with the language currently in the IRC. This adds the missing requirement from the IPC that bath tubs and showers are required to have non-absorbent floors, the same as the IRC currently requires. This change also incorporates the term "corrosion resistant" in place of "non-corrosive". The materials must be made of materials that resist corrosion. This is consistent industry terminology used throughout the I-codes.

Cost Impact: None

P59-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

417.4.1-P-HARPER

P60 – 12
417.5.2

Proponent: Tom Allen, City of Mount Dora, FL, representing self

Revise as follows:

417.5.2 Shower lining. Floors under shower compartments, except where prefabricated receptors have been provided, shall be lined and made water tight utilizing material complying with Sections 417.5.2.1 through 417.5.2.6. Such liners shall turn up on all sides not less than 2 inches (51 mm) above the finished threshold level. Liners shall be recessed and fastened to an *approved* backing so as not to occupy the space required for wall covering, and shall not be nailed or perforated at any point less than 1 inch (25 mm) above the finished threshold. Liners shall be pitched one-fourth unit vertical in 12 units horizontal (2-percent slope) and shall be sloped toward the fixture drains and be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet. The completed liner shall be tested in accordance with Section 312.9.

Exceptions:

1. Floor surfaces under shower heads provided for rinsing laid directly on the ground are not required to comply with this section.
2. Where a sheet-applied, load-bearing, bonded, waterproof membrane is installed as the shower lining, the membrane shall not be required to be recessed.
3. <u>Shower floors integrally cast into a concrete slab-on-grade floor and recessed such that the top of the shower drain is not less than 2 inches (51mm) below the room floor shall not be required to comply with this section.</u>

Reason: Recessing shower floors in concrete slab-on-grade floors has been common practice in many areas of the country. The advantage of this method for shower receptor construction is that the threshold doesn't require a curb. The shower floor is tiled so that the shower floor is even with the floor of the room. This makes it easy for elderly people to walk in and out of the shower. Because the recessed area for the shower receptor is cast integral to the rest of the slab and that any water seepage through the tile floor would just contact concrete, there is no need to install a liner in these situations. If the shower drain did become clogged to the point where water would fill the receptor, the water would run out the threshold at the same time the level would rise to a point to begin leaking through the tile and onto the top of the floor slab. The occupant would take action to shut off the water/unclog the drain long before any water would have the chance to seep through the tile and get into areas where wood construction (stud walls) would be damaged. Again, installing a liner in this recessed floor arrangement is simply a waste of time.

Cost Impact: There is no cost impact.

P60-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

417.5.2-P-ALLEN

P61 – 12
419.1.1 (New)

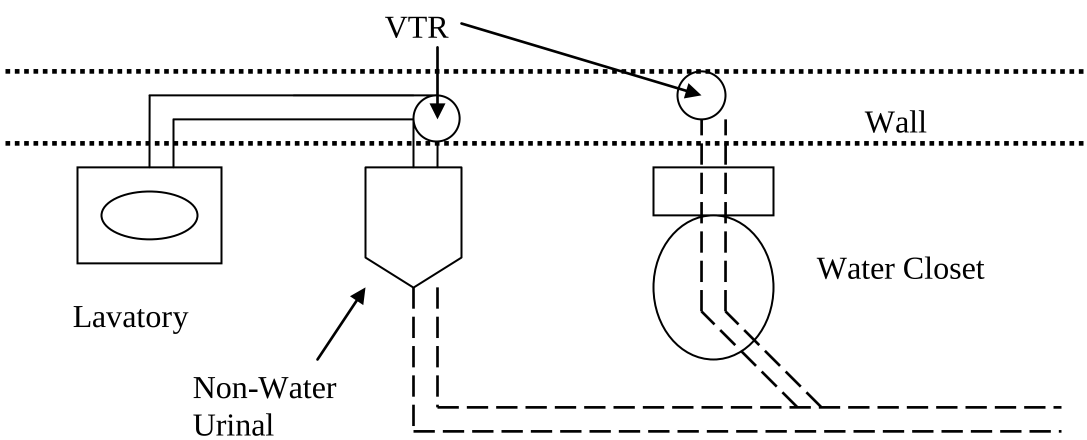
Proponent: Gary Kreutziger, M.C.P., City of San Antonio, representing self (gkreutziger@sanantonio.gov)

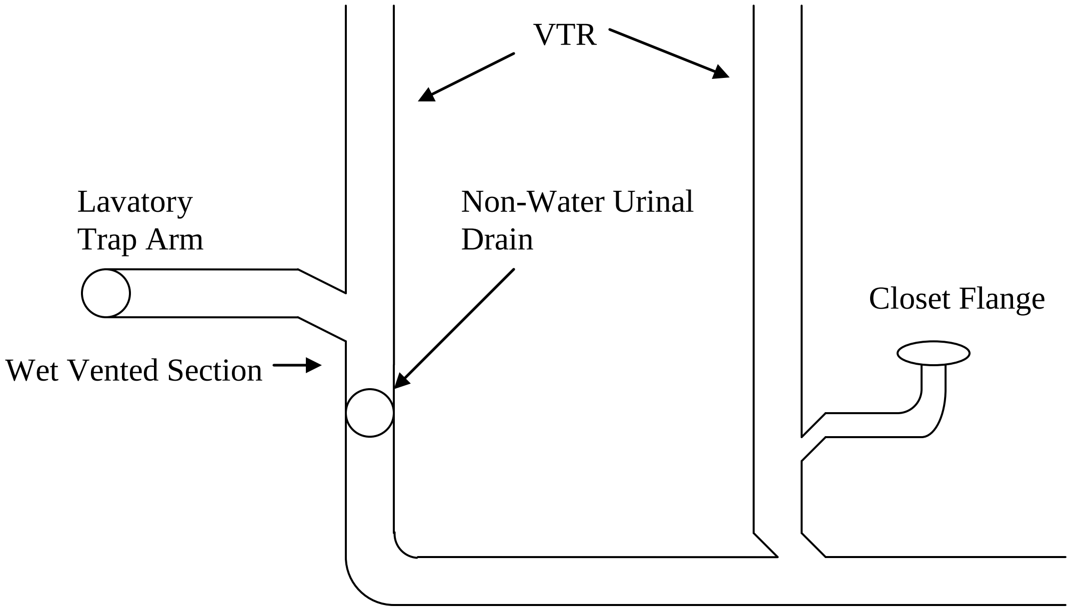
Add new text as follows:

419.1.1 Water-less urinal drain connection. The fixture drain from a water-less urinal shall be installed in accordance with one of the following:

1. The fixture drain shall connect to a horizontal drain that serves one or more water-supplied fixtures that connect to the horizontal drain upstream of the water-less urinal fixture drain connection . The vertical section of the water-less urinal fixture drain shall be provided with access and shall be installed with *mechanical joints* at each end of the vertical section of fixture drain.
2. The fixture drain shall be the lower fixture connection of a common vented drain arrangement where the upper fixture drain is a water-supplied fixture drain.

Reason: The drain lines of a water-less urinal are very prone to uric acid salt build up. Most manufacturers' maintenance protocols require flushing a urinal with water or "cleaning fluid" at every cartridge change. This flushing is too little, too late. By the time the urine has passed through the drain line and the uric acid salts are left behind to solidify the water or "cleaning fluid " have very little effect on the build up. Utilizing installation method #1 the horizontal drain line will receive frequent flushing from an upstream fixture, creating the same performance of the drain as is expected of a water-supplied urinal drain. The small vertical section of the urinal drain line that receives no flushing from an upstream fixture will remain accessible and easily replaceable with the mechanical joints when it does clog. Installation method #2 will utilize the gray water from another water-supplied fixture drain to frequently flush the entire urinal drain.





Cost Impact: The code change proposal will not increase the cost of construction.

P61-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

419.1.1 (NEW)-P-KREUTZIGER

P62 – 12
419.4 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

419.4 Nonwater urinal connection. The fixture drain for a nonwater urinal shall independently connect to a branch drain that serves one or more lavatories, water closets or water-using urinals that discharge upstream of such nonwater urinals.

Reason: Nonwater urinals have such a concentrated discharge that fixture drains and branch drain lines carrying only urine have a tendency to accumulate urine salt deposits. Designing such systems with water using fixtures is a method that solves the potential clogging problem by keeping the drain lines washed out with the discharge of other types of fixtures.. The proposed language is adapted from what is currently in the IgCC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P62-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

419.4 (NEW)-P-STRAUSBAUGH.PMGCAC

P63 – 12
420.1, Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Revise as follows:

420.1 Approval. Water closets shall conform to the water consumption requirements of Section 604.4 and shall conform to ANSI Z124.4, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5. Water closets shall conform to the hydraulic performance requirements of ASME A112.19.2/CSA B45.1. Water closet tanks shall conform to ANSI Z124.4, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5. Electro-hydraulic water closets shall comply with ASME A112.19.2/CSA B45.1. <u>Water closets equipped with a dual flushing device shall comply with ASME A112.19.14.</u>

Add new standard to Chapter 14 as follows:

ASME
<u>A112.19.14–2006(R2011)</u>   <u>Six-Liter Water Closets Equipped with a Dual Flushing Device</u>

Reason: Dual flush water closets which consist of a full flush of 1.6 gpf and a reduce flush of less than 1.1 gpf do exist and should be required to comply with some performance requirements. This is a National standard (ANSI) which covers the performance requirements for these types of systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.19.14-2006(R2011) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P63-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

420.1-P-CONSTANTINO

P64 – 12
420.1.1 (New), Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Add new text as follows:

<u>**420.1.1 Dual flush devices.** Dual flush devices for water closets shall comply with ASME A112.19.10.</u>

Add new standard to Chapter 14 as follows:

ASME
<u>A112.19.10–2003(R2008)</u> <u>Dual Flush Devices for Water Closets</u>

Reason: Dual flush devices for water closets is a device that consist of a full flush of 1.6 gpf and a reduce flush of less than 1.1 gpf and these products do exist and should be required to comply with some performance requirements. This is a National standard (ANSI) which covers the performance requirements for these types of systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.19.10, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P64-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

420.1.1(NEW)-P-CONSTANTINO

P65 – 12
420.3

Proponent: Bob Scott and Kye Lehr - Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

420.3 Water Closet Seats. Water closets shall be equipped with seats of smooth, nonabsorbent material. All seats of water closets provided for public or employee toilet facilities shall be of the hinged open-front type. Integral water closet seats shall be of the same material as the fixture. Water closet seats shall be sized for the water closet bowl type.

> **Exception**: Water closet seats shall not be required in facilities such as mental health centers or correctional facilities.

Reason: Seats are commonly eliminated in these facilities to avoid suicide or injury to the occupants. Adding the exception will allow these installations without conflict to the code.

Cost Impact: None. The elimination of seats would reduce costs and labor to install them.

P65-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

420.3 #1-P-SCOTT-LEHR

P66 – 12
420.3

Proponent: Bob Scott and Kye Lehr - Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

420.3 Water closet seats. Water closets shall be equipped with seats of smooth, nonabsorbent material. All seats of water closets provided for public or employee toilet facilities shall be of the ~~hinged~~ open-front type. Integral water closet seats shall be of the same material as the fixture. Water closet seats shall be sized for the water closet bowl type.

Reason: Seats are commonly eliminated in public facilities such as mental health centers or correctional facilities. Removing the "hinged" verbiage allows integral water closet seats to be used.

Cost Impact: None. The elimination of this word would only clarify the code.

P66-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

420.3 #2-P-SCOTT-LEHR

P67 – 12
420.5 (New)

Proponent: Christopher Salazar / Penguin Toilets LLC./ Penguin Toilets LLC

Add new text as follows:

420.5 Overflow protection. Where an overflow from the bowl of a water closet will cause damage, one of the following shall be installed:

1. A water closet with overflow protection means.
2. A floor drain located within the same room as the water closet.

Reason: To be in compliance with IPC section 101.3: (to provide minimum standards to safeguard life or limb, health, property and public welfare)

Toilet overflow (BLACKWATER spill) has not been addressed in the current code. Different from a grey water spill, a black water spill pose an unhealthy environment and is a very expensive event to mediate/repair. Adding this section into the code provides an additional safeguard to health, property and public welfare thus improving this code.

Cost Impact: The code change proposal will not increase the cost of construction. Cost impact is none to little depending on method of protection.

P67-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

420.5 (NEW)-P-SALAZAR

P68 – 12
421.1

Proponent: Bob Eugene, Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

421.1 Approval. Whirlpool bathtubs shall comply with ASME A112.19.7/CSA B45.10 and shall be listed and labeled in accordance with UL1795.

Add new standard to Chapter 14 as follows:

UL
1795-2009 Hydromassage Bathtubs, including revisions through August 23, 2011

Reason: Referenced UL standard contains important safety and plumbing requirements that should be covered in the International Plumbing Code.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, UL 1795-2009 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P68-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

421.1-P-EUGENE

P69 – 12
422.11(New)

Proponent: Daniel D. Fish, Roda LLC, representing self (info@drainbrain.us)

Add new text as follows:

422.11 Wastewater leak containment, detection and notification. An early-warning wastewater leak containment, detection and notification device shall be required in hospitals and other healthcare occupancies. The device shall contain and detect wastewater leakage from water closets, showers and bathtubs. The device shall be equipped with an auditory alarm, visual signal, and a means for notification to the building occupants, property owners or the property management staff. The auditory alarm shall have a sound pressure level rating of not less than 85 dB when measured at a distance of ten feet.

Reason: Millions of wastewater leaks occur every year in multi-story buildings from leaking drains, waste lines, and toilets. Toilets are especially high risks for water leakage. Research has shown that 30 percent of all toilets in the United States leak. Toilets with unreliable wax gaskets and flanges – a common problem – cause the most damage to the unit below. Also, the float valve that controls water entering the toilet tank often malfunction, which allows water to run into toilet waste line continuously.

Wastewater leaks typically go undetected until considerable damage has been done. These leaks: (1) waste millions of gallons of water, (2) damage property/materials, generating millions of tons of debris that swells landfills, and (3) develop mold on building components, creating property damage and a health hazard. Property owners spend millions of dollars to repair the damage from wastewater leaks and cure mold-related problems

. An early-warning wastewater leak containment, detection, and notification device will give building occupants and facility managers/owners the opportunity to avoid wastewater leak damage and its attendant costs. Taking action early will conserve millions of gallons of water and eliminate the environmental, economic, and health hazards from wastewater leaks. This solution for the age-old wastewater leak problem will meet the intent of this code by safeguarding the public health, safety, and welfare.

Cost Impact: The code change proposal will not increase the cost of construction.

P69-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

422.11 (NEW)-P-FISH

P70 – 12
423.3 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

423.3 Footbaths, pedicure baths and head shampoo sinks. The water supplied to specialty plumbing fixtures such as pedicure chairs having an integral foot bath tub, footbaths, and head shampoo sinks, shall be limited to a maximum temperature of 110 °F by a water temperature limiting device that conforms to ASSE 1070 or CSA B125.3.

Reason: The code does not address maximum water temperature for foot baths and head shampoo sinks. Feet and heads should be protected from potentially scalding water.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P70-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

423.3 (NEW)-P-STRAUSBAUGH.PMGCAC

P71 – 12
424.3

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Revise as follows:

424.3 Individual shower valves. Individual shower and tub-shower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016 or ASME A112.18.1/CSA B125.1 when tested at a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m). ~~and~~ Such valves shall be installed at the point of use. Such valves shall be factory marked with the manufacturer's minimum rated flow and such marking shall be visible at final inspection. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions. In-line thermostatic valves shall not be utilized for compliance with this section.

Reason: The thermal protection afforded by shower valves can be compromised if the flow rate of the showerhead is less than the flow rate for which the protective components of the valve have been designed. As noted by Martin and Johnson (2008) (as cited in Codes and Standards Enhancement Initiative (CASE), "Multi-Head Showers and Lower-Flow Shower Heads," *2013 California Building Energy Efficiency Standards,* California Utilities Statewide Codes and Standards Team, September 2011), combinations of valves and shower heads were tested to determine whether pressure-compensating valves and thermostatic valves rated for 2.5gpm would perform adequately at lower flow rates. The tests included 22 shower valves from six manufacturers, and the valves were assessed on their ability to maintain water temperature within certain bounds for a given time after a change in pressure event, as described by the ASSE 1016-2005 standard for shower valves. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the thermal protection specified by ASSE 1016 when tested at lower flow rates. As summarized in the CASE report (p. 15): "These results indicate that shower valve temperature maintenance is strongly affected by flow rate, and that new showers with lower-flow shower heads would have to be installed with valves that are designed for 2.0 and lower flow rates."

Showerheads with maximum flow rates below 2.5 gpm are widely available on the market today, and simple replacement of a showerhead is typically not subject to code. Since shower valve components are located behind finished walls, replacement of showerheads is likely to be more frequent than replacement of shower valves. This proposed change seeks to reduce the likelihood that consumers replacing a showerhead will compromise the thermal protection offered by a building subject to this code by ensuring that shower valves can fully accommodate showerheads with lower flow rates than the current maximum federal standard of 2.5 gpm. The current EPA WaterSense specification for showerheads has a maximum flow rate of 2.0 gpm, and many showerheads are already available with flow rates between 2.0 and 1.5 gpm. As manufacturers continue to innovate with more water- and energy-efficient showerheads, the code change proposed here will help ensure that new buildings built to this code can safely accommodate showerheads with lower flow rates that may be selected by building occupants in future years.

Note that this language does not require that the showerhead itself have a flow rate of 1.5 gpm, but simply that the shower valve provide the thermal protection called for under the recognized standard when tested at a flow rate as low as 1.5 gpm.

Cost Impact: Conforming products are on the market today without a significant cost premium. The code change proposal will not increase the cost of construction.

P71-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

424.3-P-OSANN

P72 – 12
424.4

Proponent: Edward R. Osann, Natural Resources Defense Council, representing himself (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Revise as follows:

424.4 Multiple (gang) showers. Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an *approved* automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3 <u>when tested at a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m)</u>, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE1016 or ASME A112.18.1/CSA B125.1 <u>when tested at a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m)</u> and is installed at the point of use. <u>Such valves shall be factory marked with the manufacturer's minimum rated flow and such marking shall be visible at final inspection.</u> Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions.

Reason: The thermal protection afforded by shower valves can be compromised if the flow rate of the showerhead is less than the flow rate for which the protective components of the valve have been designed. As noted by Martin and Johnson (2008) (as cited in Codes and Standards Enhancement Initiative (CASE), "Multi-Head Showers and Lower-Flow Shower Heads," *2013 California Building Energy Efficiency Standards,* California Utilities Statewide Codes and Standards Team, September 2011), combinations of valves and shower heads were tested to determine whether pressure-compensating valves and thermostatic valves rated for 2.5gpm would perform adequately at lower flow rates. The tests included 22 shower valves from six manufacturers, and the valves were assessed on their ability to maintain water temperature within certain bounds for a given time after a change in pressure event, as described by the ASSE 1016-2005 standard for shower valves. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the thermal protection specified by ASSE 1016 when tested at lower flow rates. As summarized in the CASE report (p. 15): "These results indicate that shower valve temperature maintenance is strongly affected by flow rate, and that new showers with lower-flow shower heads would have to be installed with valves that are designed for 2.0 and lower flow rates."

Showerheads with maximum flow rates below 2.5 gpm are widely available on the market today, and simple replacement of a showerhead is typically not subject to code. Since shower valve components are located behind finished walls, replacement of showerheads is likely to be more frequent than replacement of shower valves. This proposed change seeks to reduce the likelihood that consumers replacing a showerhead will compromise the thermal protection offered by a building subject to this code by ensuring that shower valves can fully accommodate showerheads with lower flow rates than the current maximum federal standard of 2.5 gpm. The current EPA WaterSense specification for showerheads has a maximum flow rate of 2.0 gpm, and many showerheads are already available with flow rates between 2.0 and 1.5 gpm. As manufacturers continue to innovate with more water- and energy-efficient showerheads, the code change proposed here will help ensure that new buildings built to this code can safely accommodate showerheads with lower flow rates that may be selected by building occupants in future years.

Note that this language does not require that the showerhead itself have a flow rate of 1.5 gpm, but simply that the shower valve provide the thermal protection called for under the recognized standard when tested at a flow rate as low as 1.5 gpm.

Cost Impact: Conforming products are on the market today without a significant cost premium. The code change proposal will not increase the cost of construction.

P72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

424.4-P-OSANN

P73 – 12
424.8

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Revise as follows:

424.8 Transfer valves. Deck-mounted bath/shower transfer valves containing an integral atmospheric vacuum breaker shall conform to the requirements of ASME ~~A112.18.7~~ A112.18.1/CSA B125.1.

Reason: Update Section 424.8 by referencing ASME A112.18.1/CSA B125.1 since the requirements from A112.18.7 are now covered in A112.18.1/B125.1 and also deleting standards from Chapter 14. The A112.18.7 standard is longer published by ASME.

Cost Impact: The code change proposal will not increase the cost of construction.

P73-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

424.8-P-CONSTANTINO

P74 – 12

428 (New), 428.1 (New), 428.2 (New), Chapter 14

Proponent: Jeremy Brown, NSF International (Jeremy@nsf.org)

Add new text as follows:

SECTION 428
NON-LIQUID SATURATED TREATMENT SYSTEMS

428.1 Approval. Materials, design, construction and performance of non-liquid saturated treatment systems shall comply with NSF 41.

428.2 Installation. Non-liquid saturated treatment systems shall be installed in accordance with the manufacturer's instructions.

Add new standard to Chapter 14 as follows:

NSF
41-2011 Non-liquid Saturated Treatment Systems

Reason: NSF/ANSI-41 *Non-liquid Saturated Treatment Systems* is the American National Standard for the materials, design, construction and performance of composting toilets treating residential black water. Composting Toilets are a viable alternative are a viable alternative to traditional water closets and offer advantages of low water consumption. NSF/ANSI 41 is currently permitted in the IPSDC. A copy of this standard may be obtained from brown@nsf.org

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NSF 41-2011, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P74-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

428-P-BROWN

P75 – 12
501.3

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

501.3 Drain valves. Drain valves for emptying shall be installed at the bottom of each tank-type water heater and hot water storage tank. ~~Drain valves shall conform to ASSE 1005.~~ The drain valve inlet shall be not less than ¾ inch nominal iron pipe size and the outlet shall be provided with male garden hose threads.

Reason: ASSE discontinued the 1005 standard. The new language proposed for this section provides for minimum requirements for water heater drain valves.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P75-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.3-P-STRAUSBAUGH.PMGCAC

P76 – 12
501.6

Proponent: Ron George, CPD, Plumb-Tech Design & Consulting Services LLC, representing self (Ron@Plumb-TechLLC.com)

Revise as follows:

501.6 Water temperature control ~~in piping from tankless~~ <u>for water</u> heaters. <u>The temperature of hot water supplied to a hot water distribution system that supplies hot water for domestic use shall not exceed</u> ~~from tankless water heaters shall be not greater than~~ 140°F (60°C) ~~where intended for domestic uses~~. <u>The thermostat on the water heater supplying such system shall not be used for meeting this provision.</u> This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

Reason: There is no reason to limit the maximum hot water temperature in just tankless water heaters. The thermostat dial on a water heater is not intended or designed to adequately control the outlet hot water temperature of a water heater. The water heater thermostat is located near the bottom of the water heater to sense incoming cold water and turn "on" and "off" the fuel source for a storage type water heater. Other code sections for combined systems, (IPC 501.2 and 501.6) already limit hot water intended for domestic used to 140 degrees Fahrenheit. This code change correlates with those code requirements and applies to all water heaters for all domestic hot water. Recent ill advised, attempts to minimize scalding have been to simply instruct people to turn the thermostat down on a water heater. When this is done hot water runs short and other problems occur in the system. Calls of "lack of hot water" usually result in the thermostat being readjusted upwards after users experience a hot water shortage. This increases the scalding potential significantly. The thermostat on the water heater does not accurately control the outlet temperature of hot water from a water heater. Turning down the thermostat can cause condensing and premature corrosion from the burner side of the heater, a shortage of hot water and lower temperatures increase the possibility of incubating or amplifying the bacteria like Legionella in the hot water system to levels that can trigger outbreaks in people with suppressed immune systems. A thermostatic mixing valve located as shown in figure 6 would allow the water heater to be turned up to a temperature that would minimize condensation, kill Legionella bacteria and deliver an ample supply of hot water and allow hot water to be delivered at a safe temperature.

<u>Temperature/Time Burn Chart</u>

Temp. in Deg. F	Time for 1st deg. Burn.	Time for 2nd -3rd Deg. Burn.
111 F =	270 min's.	300 min's.
113 F =	120 min's.	180 min's.
116 F =	20 min's.	45 min's.
118 F =	15 min's.	20 min's.
120 F =	8 min's.	10 min's.
124 F =	2 min's.	4.2 min's.
131 F =	17 seconds	30 seconds
140 F =	3 seconds	5 seconds
151 F =	Instant	2 Seconds

(Source: Report prepared by Dr. Moritz and Dr. Henriques at Harvard Medical School in the 1940s for adult males. Children and elderly can receive burns in less time because their skin is thinner.)

Figure 1 – Table showing the relationship of Time/Temperature and Degree of Burn

Figure – 2 Photos of scald burns.

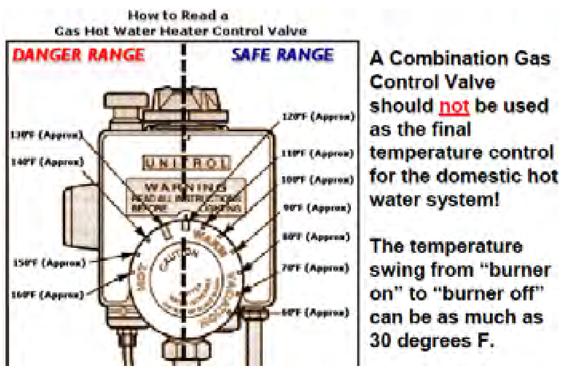


Figure 3 – T-Stat Setting – illustration from a manufacturers catalog.

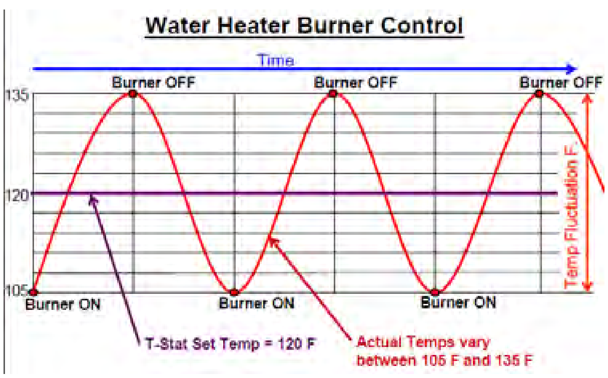


Figure 4 – Example of Water heater Thermostat setting verses HW outlet temperature at the top of the heater.

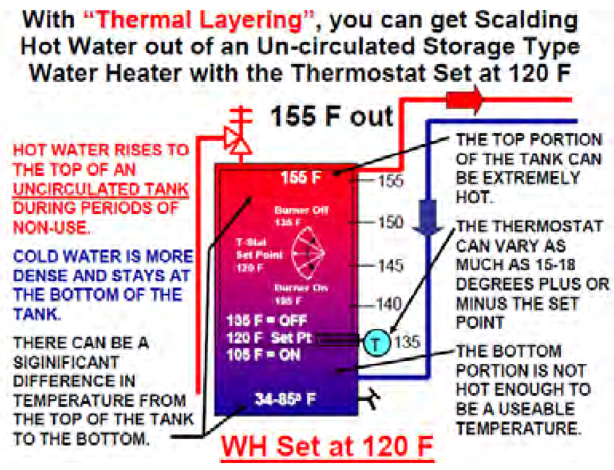


Figure 5 – Illustration showing how stacking or thermal layering
This figure shows how the hot water at the top outlet of a water heater can exceed the thermostat setting near the bottom of the water heater.

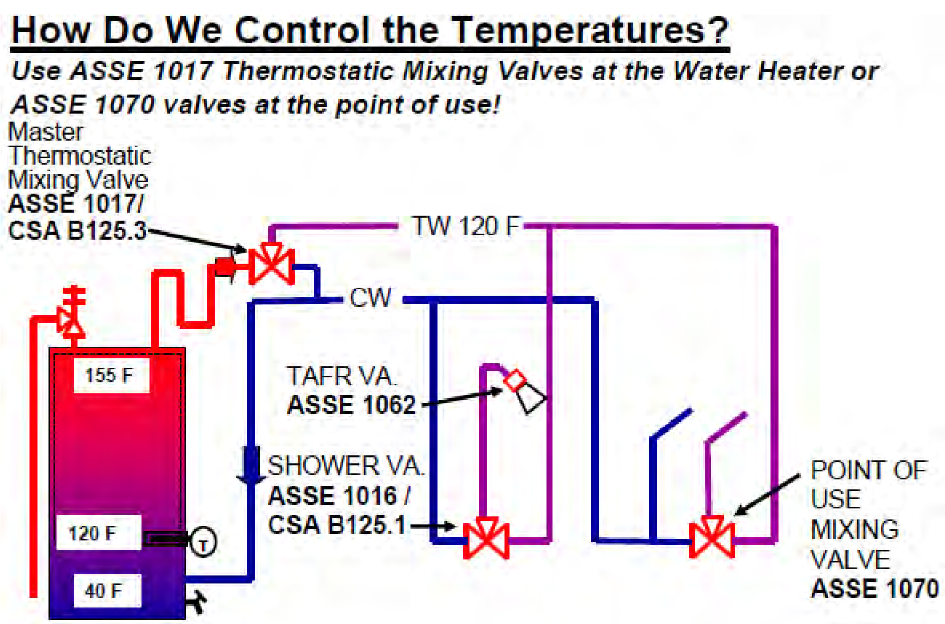


Figure 6 – Illustration of various temperature control methods available.

Cost Impact: This code change will slightly increase the cost of construction in some cases. Mixing valves are already required when temperatures exceed 140 F. A properly designed hot water system will already have a thermostatic mixing valve. There are several types of devices available to accomplish the tempering of the domestic hot water. ASSE 1070 thermostatic temperature limiting valves and ASSE 1017 Master thermostatic mixing valves can be utilized to provide safe hot water distribution temperatures.

P76-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.6-P-GEORGE

P77 – 12
501.8

Proponent: Ron George, CPD, Plumb-Tech Design & Consulting Services LLC representing himself (Ron@Plumb-TechLLC.com)

Revise as follows:

501.8 Temperature controls. ~~Hot water supply systems~~ Water heaters shall be equipped with an automatic temperature control thermostat capable of adjustments from the lowest to the highest ~~acceptable~~ temperature settings for the intended temperature operating range. Water heaters installed in dwelling units shall have a maximum thermostat temperature setting capability of 160°F (71.1°C). Water heaters installed in other than dwelling units shall have a maximum thermostat temperature setting capability of 180°F (82.2°C). Thermostats on water heaters shall not be used to limit the water temperature discharged from shower valves or bathtub valves as required by Sections 424.3 through 424.5.

Reason: All residential water heaters have a maximum thermostat setting of 160 F. All commercial water heaters have a maximum thermostat setting of 180F. Heating boiler thermostats can go up to 200 degrees Fahrenheit. This language will assure that the inspector can verify that the proper temperature range thermostat is installed in accordance with the available thermostat temperature ranges for a given installation. The water heaters are supplied with installation and operation manuals that indicate the temperature settings on the thermostat dial. Inspectors can verify the maximum water heater outlet temperature by looking at the literature if it is not printed on the thermostat dial. The thermostat temperature ranges are called out in the ANSI or UL standards for thermostats. The boiler thermostat would be covered in the mechanical code so it was not listed here.

The language also allows the inspector to verify that proper temperature controls are installed on the water heater for a given application. The language about the thermostat not being the final temperature control was added here for instances where a permit is pulled for inspection of a water heater replacement. The inspector can verify if an approved type of shower or water temperature control valve is installed downstream of the water heater to protect bathers in older installations so that they are not relying only on the water heater thermostat. This language helps the inspector to verify that the proper safety devices such as an ASSE 1017 master mixing valve, or an ASSE 1070 (point-of-use) local mixing valve or an ASSE 1016 shower or tub/shower valve or an ASSE 1069 gang shower valve is installed downstream of the water heater to protect the bather from scalding or thermal shock hazards.

Cost Impact: There is no additional cost to construction associated with this code change. This change is simply adding clarification and correlation between other sections of the code.

P77-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.8-P-GEORGE

P78 – 12
502.6 (New)

Proponent: Tom Allen, City of Mt. Dora, FL, representing self

Add new text as follows:

502.6 Water heater instructions. Water heaters shall be installed in accordance with the manufacturer's instructions. Such instructions shall be available on the job site at the time of inspection.

Reason: Allows for installation per the manufacturer's requirements and requires the instructions to be on site for inspection.

Cost Impact: There is no cost impact.

P78-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

502.6 (NEW)-P-ALLEN

P79 – 12
504.4

Proponent: Dana Bres, P.E./U.S. Department of Housing and Urban Development/U.S. Department of Housing and Urban Development (dana.b.bres@hud.gov)

Revise as follows:

504.4 Relief valve. Storage water heaters operating above atmospheric pressure shall be provided with an approved, self-closing (levered) pressure relief valve and temperature relief valve or combination thereof. The relief valve shall conform to ANSI Z21.22. The relief valve shall not be used as a means of controlling thermal expansion. <u>Tankless water heaters shall not be required to be provided with a pressure relief valve or a temperature relief valve except where such valves are required by the tankless water heater listing or the tankless water heater manufacturer's instructions.</u>

Reason: The discussion of temperature and pressure relief valves for tankless water heaters is vague. The current language in IPC 504.4 is silent on tankless water heaters, which can lead to confusion. For electric tankless water heaters, UL 499 (Sec 28.11) indicates a requirement when the vessel diameter is more than 3.0 inches. Tankless water heaters have little stored volume and the burner or heating element operates only when water is being consumed. The proposed change would clarify the code requirements for installation of tankless water heaters. Similar changes will be proposed to section P2803 of the IRC in the next cycle. This change would help harmonize the two codes and would clarify the current code language regarding installation of tankless water heaters. These changes would facilitate the acceptance of an appliance that provides energy and space savings in a home.

Cost Impact: The code change proposal will not increase the cost of construction.

P79-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.4-P-BRES

P80 – 12
504.6

Proponent: Roger Harper, Jr, Louisa County VA Representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (sharper@louisa.org)

Revise as follows:

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

(Items 1-9 remain unchanged)

10. ~~Not~~ terminate not more than 6 inches (152 mm) above and not less than two times the discharge pipe diameter above the floor or waste receptor flood level rim.

Reason: A minimum distance is not stated. Typically, the minimum air gap would be two nominal pipe diameters as stated in Section 802.2.1 for indirect wastes pipe.

Cost Impact: None

P80-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.6-P-HARPER

P81 – 12
504.6

Proponent: Bob Scott, Kye Lehr and Dennis Gardner, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, Temperature relief valve or combination thereof shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4 Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge to the floor, ~~to the pan serving the heater or storage tank,~~ to a waste receptor or to the outdoors.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

Reason: We all know what the commentary states is true that the relief valve discharges are in small amounts or continuous trickles of water or all out blowouts and with the latter the pan will not handle it anyway. The pan drain will allow the pan to retain from ½"to ¾" of water leaving the water heater to set in a pool of water until the problem is found by the owner. Most owners are not mechanically inclined and will not look at the water heater until it fails leaving the legs or the bottom of an electric water heater to rust to an unsafe condition thus creating another problem either with the electric, gas or flue piping connection. All of which could produce disastrous consequences. Pans were brought in because of the concerns for structural damage which I feel is justified, we are trading one problem for others and we need to solve all. Our jobs are to protect the home owners not make the job easier for the installers.

Cost Impact: None-the pan must already go to an approved place of disposal that drain can serve both the pan and the P&T valve by many methods.

P81-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.6-P-SCOTT-LEHR-GARDNER

P82 – 12
504.6

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

(Items 1 through 13 remain unchanged)

14. <u>Be one nominal size larger than the size of the relief valve outlet, where the relief valve discharge piping is constructed of PEX or PE-RT tubing. The outlet end of such tubing shall be fastened in place.</u>

Reason: PEX and PE-RT tubing use insert fittings for connections. The bore size for a ¾ inch male adapter fitting is small such that there is concern that the discharge from a T & P valve could be restricted. The proposed language requires that PEX and PE-RT tubing used for relief valve discharge piping be one size larger so that the insert fitting has a larger bore which would not restrict flow.

PEX and PE-RT tubing is somewhat flexible and where supplied from a coil, the tubing has a memory to stay in a coil shape. This flexibility and memory to a coil shape can cause the discharge end of the tubing to be displaced from its required or intended position. To prevent displacement, new language is being added to require that the outlet end of the tubing be fastened in place.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P82-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.6-P-STRAUSBAUGH.PMGCAC

P83 – 12
504.7

Proponent: Ron George, CPD, Plumb-Tech Design & Consulting Services LLC, representing himself (Ron@Plumb-TechLLC.com)

Revise as follows:

504.7 Required pan. Where a ~~storage tank-type~~ water heater or a hot water storage tank is installed in a location where water leakage from the water heater or tank will cause damage, the water heater or tank shall be installed in a galvanized steel pan having a material thickness of not less than 0.0236 inch (0.6010mm) (No. 24 gage), or other pans approved for such use.

> **Exception:** A drain pan shall not be required for a tankless water heater installed in an exposed location under a wall hung fixture where the floor material under the water heater is waterproof, there is a floor drain nearby and the water heater is in a readily observable location under the fixture.

Reason: During the last code cycle a code change was submitted to change the wording to this section to so that only require tank type water heaters would require drain pans. There was testimony from people wanting to eliminate drain pans under tankless water heaters with statements that tankless heaters don't have tanks and there is only a few ounces of water in the heat exchange therefore they do not need drain pans because not much water is stored in them so the potential for leaks was not there. This code change is to correct that loophole that will allow water damage from tankless heaters. Tankless water heaters work under significant thermal stresses and are subject to failures and leaks at a rate equivalent to or greater than tank type heaters. When tankless water heaters leak, they are connected to the entire municipal water system, so the volume of water in the heater is irrelevant. Small leaks can cause significant water damage. Tankless heaters can leak hundreds or thousands of gallons and cause significant structural damage to building materials that are subject to water damage. I realize some installations can be installed under a lavatory or wall hung sink in a restroom with tile or other water resistant flooring materials and a floor drain so the potential for damage is less as long as they are located in an areas where a leak would be readily observable, the flooring is water resistant and a drain is located in the same room. I proposed the above code change to address the need for a drain pan under all water heaters located in concealed locations where water leaks can cause structural damage. I have witnessed several plastic and fiberglass bodied electric tankless water heaters fail over the years. When many of them failed, they leaked and caused significant structural and property damage. A quick search of the internet yielded several examples of tankless water heater failures. I do not know the person in this video and I have no problems with the manufacturer in the video. This video simply demonstrates that tankless heaters can cause as much or more water damage than a tank type heater. Tankless heaters are often manufactured from plastic or other polymer materials that can fail catastrophically. The attached link shows a video of one of these tankless heater failures that leaked and caused significant structural damage to hardwood floors and other water damage on the floors below.
http://www.youtube.com/watch?v=BgU-rjh2LXE,

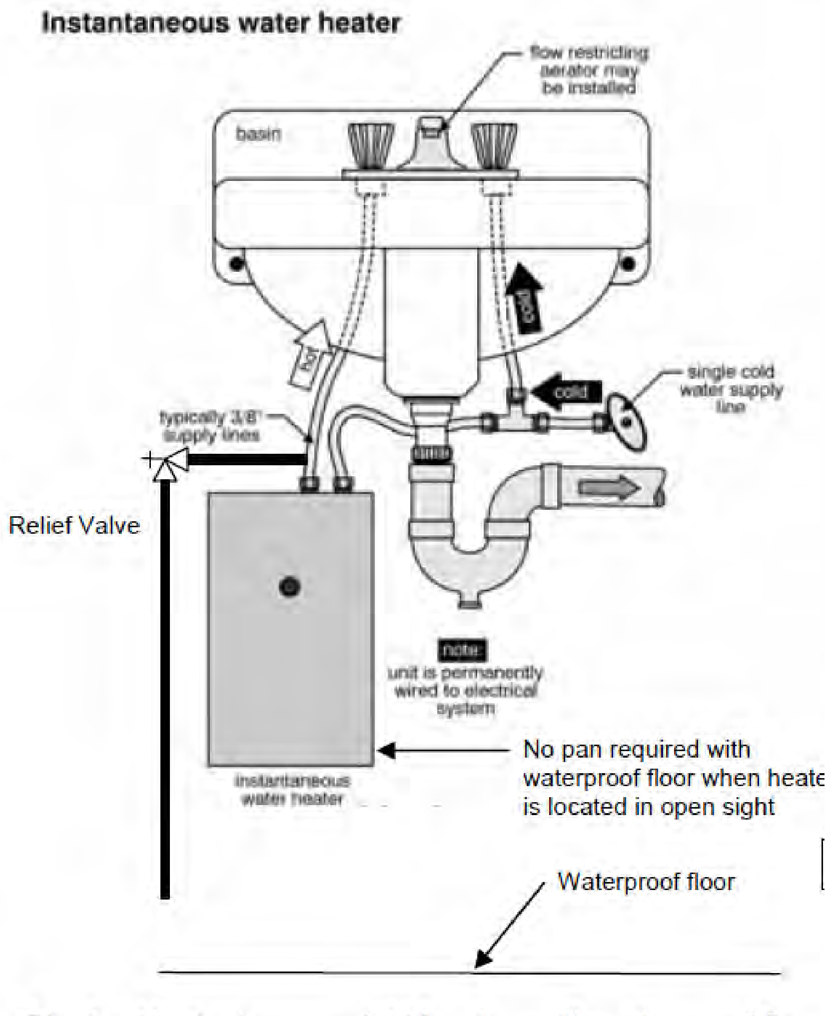


Fig. 1 – Heater in open sight location with water proof floor

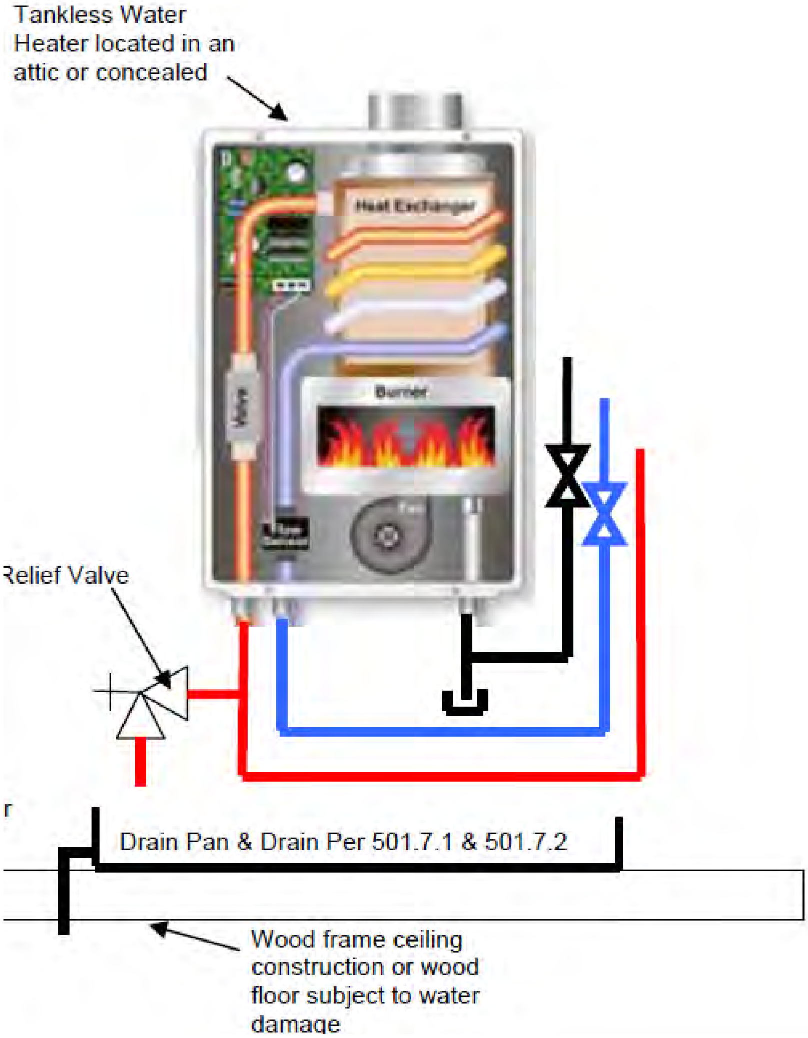


Fig. 2 – Heater located in concealed location with construction subject to water damage

Cost Impact: The code change proposal will not increase the cost of construction when there is a construction material or flooring that will not be damaged by water and exposed tankless heater are located under a lavatory. Pans were required for all water heaters prior to the previous code
cycle code change. The requirement to only require drain pans under tank type heaters appears to be an effort to make the more expensive tankless heaters more affordable and increasing the risk of damage to building materials and contents. Calculations show that when you factor in the purchase price and life expectancy, of tankless heaters versus newer high efficient storage type heaters and the increased in size of the energy service and installation costs tankless heaters do not save money over the life of the heater.

P83-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.7-P-GEORGE

P84 – 12
504.7

Proponent: Tom Allen, City of Mount Dora, FL, representing self

Revise as follows:

504.7 Required pan. Where a storage tank-type water heater or a hot water storage tank is installed <u>above the ground floor space, in attics, in areas above ceilings or within the habitable space</u> ~~in a location where water leakage from the tank will cause damage,~~ the tank shall be installed in a galvanized steel pan <u>or other metal pan of equal corrosion resistance</u> having a material thickness of not less than 0.0236 inch (0.6010mm) (No. 24 gage), or other pans approved for such use. <u>Electric water heaters shall be installed in a metal pan as herein required or in a pan of high-impact material having a thickness of not less than 0.0625 inch (1.59 mm).</u>

Reason: Clarifies pan locations "in a location where water leakage form the tank will cause damage" is too subjective. Allows for other metal pans and for plastic pans for electric water heaters.

Cost Impact: There is no cost impact.

P84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.7-P-ALLEN

P85 – 12
504.7, 504.7.1

Proponent: Jim Whitehead, IPS Corporation

Revise as follows:

504.7 Required pan. Where a storage tank-type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan. Pans shall be constructed of galvanized steel ~~pan~~ having a material thickness of not less than 0.0236 inch (0.6010mm) (No. 24 gage), aluminum having a material thickness of not less than 0.030 inch (0.762 mm), plastic having a material thickness on the bottom of the pan of not less than 0.036 inch or other ~~pans~~ approved materials ~~for such use~~.

504.7.1 Pan size and drain. The pan shall be not less than 1½ inches (38 mm) in depth and shall be ~~of sufficient size and shape to receive all dripping or condensate from the tank or water heater.~~ not less than 2 inches (51 mm) larger in width or diameter than the diameter of the water heater or tank. The pan shall be drained by an indirect waste pipe having a diameter of not less than 3/4 inch (19 mm). Piping for safety pan drains shall be of those materials listed in Table 605.4.

Reason: Inspectors call our company often to determine if a water heater pan made of anything other than galvanized steel (24 gage) is acceptable and how is it deemed acceptable. Clarifying the standard to include the common materials used will be helpful to inspectors in the field.

Cost Impact:

P85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.7-P-WHITEHEAD

P86 – 12
504.7.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

504.7.2 Pan drain termination. The pan drain shall extend full-size and terminate over a suitably located indirect waste receptor or floor drain or extend to the exterior of the building and terminate not less than 6 inches (152 mm) and not more than 24 inches (610 mm) above the adjacent ground surface. <u>Where a pan drain was not previously installed, a pan drain shall not be required for a replacement water heater installation.</u>

Reason: Consider a water heater installation where the code did not require the original installation to have a drain for the T&P valve or a drain for a drip pan or such drain was required, but never installed. Upon replacement of the water heater, under the current code, a drain is required. Should a drain be installed regardless of the difficulty or cost?

The replacement of an existing water heater must be installed to the current code as if it was a new installation. If the original water heater installation did not require a pan, then in many cases, there is not a suitable disposal point for a pan drain. However, if the installation requires a pan, the current code requires that the pan have a pan drain. Many times, there is not a way to provide for a suitable disposal point for the pan drain. For example, consider a slab-on-grade building where the water heater is located in the center of the building where there is not a floor drain or waste receptor. When that water heater is replaced, the current code requires that the water heater have a pan and that the pan have a pan drain (that runs to a suitable disposal point). How is this to be accomplished in this existing building? There is not always a practical solution. Therefore, the proposed language provides an exception for replacement water heaters to not be required to have a pan drain, if the installation requires a pan. The code would still require the pan, but not the pan drain. A pan with no drain is better than no pan at all.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.7.2-P-STRAUSBAUGH.PMGCAC

P87 – 12
601.5 (New), Chapter 14

Proponent: Sidney L. Cavanaugh, Cavanaugh Consulting representing CuraFlo (sidneycavanaugh@yahoo.com)

Add new text as follows:

601.5 Rehabilitation of piping systems. Where pressure piping systems are rehabilitated using an epoxy lining system, such lining system shall comply with ASTM F 2831.

Add new standard to Chapter 14 as follows:

ASTM

F 2831-11	Standard Practice for Internal Non Structural Epoxy Barrier Coating Material Used In Rehabilitation of Metallic Pressurized Piping Systems

Reason: These systems are being used everyday across North America when systems need to be replaced or repaired when they do not meet minimum pressures and flow rates. It is important that they these epoxy lining systems meet a national consensus standard to assure proper installation and use.

Cost Impact: no additional cost when considering the replacement cost.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 2831-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P87-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

601.5 (NEW)-P-CAVANAUGH

P88 – 12
603.2

Proponent: Shawn Strausbaugh, Arlington County VA Representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7

Delete and substitute as follows:

~~**603.2 Separation of water service and building sewer.** Water service pipe and the building sewer shall be separated by not less than 5 feet of undisturbed or compacted earth.~~

~~**Exceptions:**~~

1. ~~The required separation distance shall not apply where the bottom of the water service pipe within 5 feet of the sewer is not less than 12 inches above the top of the highest point of the sewer and the pipe materials conform to Table 702.3.~~
2. ~~Water service pipe is permitted to be located in the same trench with the building sewer, provided such sewer is constructed of materials listed in Table 702.2.~~
3. ~~The required separation distance shall not apply where a water service pipe crosses a sewer pipe, provided the water service is sleeved to a point not less than 5 feet horizontally from the sewer pipe centerline on both sides of such crossing with pipe materials listed in Table 605.3, 702.2 or 702.3.~~

603.2 Separation of water service and building sewer. Where water service piping is located in the same trench with the building sewer, such sewer shall be constructed of materials listed in Table 702.2. Where the building sewer piping is not constructed of materials listed in Table 702.2, the water service pipe and the building sewer shall be horizontally separated by not less than 5 feet (1524 mm) of undisturbed or compacted earth. The required separation distance shall not apply where a water service pipe crosses a sewer pipe, provided the water service is sleeved to a point not less than 5 feet (1524 mm) horizontally from the sewer pipe centerline on both sides of such crossing. The sleeve shall be of pipe materials listed in Table 605.3, 702.2 or 702.3. The required separation distance shall not apply where the bottom of the water service pipe located within 5 feet (1524 mm) of the sewer is not less than 12 inches (305 mm) above the highest point of the top of the building sewer.

Reason: This proposal is consistent with IRC Section 2905.4.2. Exception item number 2 of the existing text is the most common method utilized for sewer and water service installations across the country. Therefore it should not be the exception but rather the rule. The other provisions, items 1 and 2 in the proposal, have not been changed but simply reformatted into a more user friendly format.

Cost Impact: None

P88-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.2-P-STRAUSBAUGH8

P89 – 12
604.2

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

604.2 System interconnection. At the points of interconnection between the hot and cold water supply piping systems and the individual fixtures, appliances or devices, provision shall be made to prevent flow between such piping systems.

> <u>**Exception:** Hot or tempered water recirculation systems that pump water from a hot or tempered water pipe through a cold water pipe back to the hot water source shall be permitted provided that the system complies with all of the following:</u>
>
> 1. <u>The system is demand activated by a switch operated by the user of the fixture, a motion sensor triggered by the presence of the user of the fixture, a flow switch activated by the flow of hot water at a fixture or a door switch activated by the door to the room containing hot water-supplied fixtures. a fixture, a door switch activated by the door to the room containing hot water-supplied fixtures or a voice activated command.</u>
> 2. <u>After the pump starts, the controls shall allow the pump to operate until the water temperature in the return pipe rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe. The controls shall not allow the pump to operate when the temperature in the pipe exceeds 102ºF (38.9 ºC). Controls shall limit pump operation to not more than 5 minutes for each activation in the event that both means of shutting off the pump have failed.</u>
> 3. <u>The manufacturer of the controls for the recirculation pump provides installation and operation instructions that provide details of the operation of the controls and such instructions are available at the jobsite for inspection by the code official.</u>

Reason: As I understand it, the intent of IPC Section 604.2 is to prevent interconnections between the hot and cold piping systems so that hot water is not drawn <u>unintentionally</u> into the cold-water piping and vice-versa. The two most obvious issues with such <u>unintentional</u> interconnections is that 1) hot water could flow from a cold water faucet which might cause a potential for scalding and 2) hot water might be prevented from ever reaching certain fixtures.

The reason for the proposed exception is to resolve the question of whether or not a "no return pipe" hot water recirculation system violates the intent of this code section.

Typical "no return pipe" hot water recirculation systems utilize a pump in the hot water line to cause flow of water from the hot water piping through a special valve and into the cold water piping near a fixture that is most remote from the water heater. Some systems have the pump operating continuously or on timer to run continuously during certain time periods of the day. Even though the pump might be running continuously or semi-continuously, the special valve controls the flow of water in the hot water pipe to the cold water pipe. Other systems are demand controlled such that the user activates the pump operation only when hot water is intended to be used.

When the temperature sensing mechanism determines that the temperature of the water in the hot water piping is either rising quickly (demand controlled) or is approximately 105 degrees F (aquastat controlled), the valve automatically closes to stop flow so that the cold water line is not continuously being filled with hot water. The valve also prevents the flow of hot water to the cold supply pipe while cold water is flowing from the faucet.

Regardless of the shut-off mechanism, the overall operation of "no return pipe" hot water systems is the same - a valve controls when flow is allowed to pass from the hot water piping to the cold-water piping.

In my opinion, even without the proposed revisions, these "no return pipe" hot water recirculation systems do not violate the intent of the code. Because the valve prevents water of a temperature greater than approximately 105 degrees F from being introduced into the cold-water piping, the potential for scalding is not an issue. The valve also prevents cold water from entering into the hot water piping so the issue of cold water replacing hot water in a water distribution system doesn't exist.

However, “no return pipe” hot water recirculation systems that use timers, aquastats or a combination of timers and aquastats to control the flow of hot water into the “temporary” cold-water return line can operate up to 24 hours a day, either intentionally or unintentionally; intentionally if the timer is set to allow the pump to run continuously. Unintentionally if the aquastat has been disconnected; or the valve is jammed open; or if the temperature drop between the water heater and the shut-off valve with aquastat is large enough to prevent the shut-off temperature from ever being reached. An example: the water heater is set at 125F, the aquastat is set to close the valve at 105F and the temperature drop between the water heater and the aquastat is 25F. This large temperature drop is possible when the pipes are installed in a vented crawl space or under a slab. The reason the pump was installed was to overcome a hot water delivery problem, which these applications almost certainly had! The problem is that with a 25F temperature drop, the temperature at the aquastat will never reach 105F (125-25 = 100F) and the valve will never close, allowing water to continually, and in some sense, unintentionally, pass into the cold-water line.

In contrast, demand controlled priming pumps shut off based on a temperature rise, rather than an absolute temperature. As an example, when the pump is activated, the controls determine the temperature of the water in the pipe, which is likely to be close to ambient room temperature or about 65-70F. The controls allow the pump to run until the temperature rises about 5F, and then shut off typically when the water temperature is between 70 and 75F. There are other safety mechanisms built into the controls that restrict operation to no more than 5 minutes or when the temperature rises to 105F. Since these pumps only operate on demand, when intentionally activated shortly before hot water is desired, they restrict the time hot water is flowing in the cold water piping to typically less than 20 minutes a day in residential occupancies served by their own water heater or boiler, and similarly small durations in other occupancies. In contrast, timer, aquastat and combination timer and aquastat controlled pumps typically operate 4-8 hours per day and often much longer, up to 24/7.

In addition to coming closest to meeting the intent of this section, which is to prevent unintentional flow between hot and cold water supply piping, demand controlled hot water priming pumps are significantly more energy efficient that the other options. The energy costs of operation are a combination of the heat losses in the piping and the electricity requirement of the pump: the heat losses dominate the energy costs. The energy costs of demand-controlled hot water priming pumps are at least 75 percent and typically 90 percent less than the alternatives.

It is for these reasons that I have proposed only allowing the exception for pumps that prime the hot or tempered water supply piping on demand.

I urge your support for this proposal. Thank you.

Cost Impact: The code change proposal will not increase the cost of construction.

No new requirements have been added, only a clarification of an existing section.

P89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

604.2-P-KLEIN

P90 – 12
Table 604.3

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Revise as follows:

TABLE 604.3
WATER DISTRIBUTION SYSTEM DESIGN CRITERIA REQUIRED CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE[a] (gpm)	FLOW PRESSURE (psi)
Bathtub, balanced-pressure, thermostatic or combination balanced-pressure/ thermo-static mixing valve	4	20
Bidet, thermostatic mixing valve	2	20
Combination fixture	4	8
Dishwasher, residential	2.75	8
Drinking fountain	0.75	8
Laundry tray	4	8
Lavatory, private	~~2~~ 0.8	8
Lavatory, private, mixing valve	0.8	8
Lavatory, public	0.4	8
Shower	~~3~~ 2.5	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/ thermo-static mixing valve	~~3~~ 2.5[b]	20
Sillcock, hose bibb	5	8
Sink, residential	~~2.5~~ 1.75	8
Sink, service	3	8
Urinal, valve	12	25
Water closet, blow out, flushometer Valve	25	45
Water closet, flushometer tank	1.6	20
Water closet, siphonic, flushometer Valve	25	35
Water closet, tank, close coupled	3	20
Water closet, tank, one piece	6	20

For SI: 1 pound per square inch = 6.895 kPa,1 gallon per minute = 3.785 L/m.
a. For additional requirements for flow rates and quantities, see Section 604.4.
b. Where the shower mixing valve manufacturer indicates a lower flow rating for the mixing valve, the lower value shall be applied.

Reason: TABLE 604.3 WATER DISTRIBUTION SYSTEM DESIGN CRITERIA REQUIRED CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS requires plumbing distribution system design to achieve flow rates of *at least* 3 gpm for showers, 2.5 gpm for sink faucets, and 2 gpm for lavatory faucets, all of which are excessive as minimum requirements. The *minimum* flow rate for a shower in this table is above the allowable *maximum* flow rate for a showerhead as specified by Table 604.4 of this code and by the nationwide standard that has been in effect for nearly 20 years. Similarly, the minimum flow rate for lavatories does not distinguish between public and private fixtures, and thus sets a minimum flow for public lavatories that is in excess of the maximum flow allowable under Table 604.4 of this code. And for residential sinks other than service sinks, the *minimum* flow rate is again set higher than the allowable *maximum* flow rate for a sink faucet as specified by Table 604.4. For applications at the low end of the acceptable range of water pressure, these excessive minimum flow values tend to encourage the oversizing of pipes leading to fixture outlets, leaving a larger volume of cooled hot water to purge before use, and thus exacerbating the problem of the energy and water lost while waiting for actual hot water to arrive at the fixture. In some installations, these excessive minimum values may require water pressure booster systems that might otherwise be unnecessary.

Under this proposal, public lavatories would be distinguished from private lavatories, single-handle mixing valves for private lavatories would be recognized, and the minimum flow rates for lavatory, residential sink, and shower supply pipes would be adjusted downward. Minimum flow rates for showers would be set at 2.5 gpm, or such lower flow rate as would match the manufacturer's minimum rated flow for the mixing valve to provide the level of thermal protection prescribed by the industry standard. The minimum flow rate for a residential sink, other than a service sink, would be set at 1.75 gpm, which is 80 percent of the value of the maximum flow rate allowed by this code under Table 604.4. The minimum flow rate for a public lavatory would be set at 0.4 gpm, 80 percent of the value of the maximum flow rate allowed by this code under Table 604.4. The minimum flow rate for a private lavatory would be set at 0.8 gpm, which is the minimum flow rate prescribed for private lavatory faucets by the US EPA's WaterSense specification (version 1.0, October 2007).

Cost Impact: This proposal will have the effect of reducing the diameter of pipe that is allowed to serve lavatories, sinks, and showers in some installations, and may also eliminate the need for water pressure booster systems in some applications. This code change proposal will not increase the cost of construction.

P90-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T604.3-P-OSANN

P91 – 12
Table 604.4

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@ndrc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Revise as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Lavatory, private	~~2.2~~ 1.5 gpm at 60 psi
Lavatory, public (metering)	0.25 gallon per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head[a]	~~2.5~~ 2.0 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	~~1.0~~ 0.5 gallon per flushing cycle
Water closet	~~1.6~~ 1.3 gallons per flushing cycle[c]

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m,1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray is a shower head.
b. Consumption tolerances shall be determined from referenced standards.
c. The effective flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush.

Reason: The maximum flow rates and water consumption levels in the current Table 604.4 for water closets, urinals, shower heads, and lavatory faucets equate to nationwide standards enacted nearly 20 years ago. In December, 2010, the US Department of Energy determined that states were no longer preempted from adopting more stringent efficiency standards for these products. (*Federal Register*, Vol. 75, No. 245, December 22, 2010, p. 80289; this document is attached).

Today, fixtures and fittings that perform well at flush volumes and flow rates lower than the values currently shown in Table 604.4 are widely available. Since 2006, the establishment of the WaterSense voluntary labeling program for water efficient products and services by the Environmental Protection Agency has provided a framework for the recognition of products that are substantially more efficient than minimum federal requirements while maintaining full functionality and customer satisfaction. WaterSense criteria were established for tank-type toilets (1.28 gpf) in 2007; lavatory faucets (1.5 gpm @ 60 psi) in 2007; urinals (0.5 gpf) in 2009; and showerheads (2.0 gpm @ 80 psi) in 2010. Manufacturers have responded by bringing large numbers of models to market that meet or exceed WaterSense specifications. Based on the most recent reports by WaterSense partners, the following figures regarding the number of WaterSense labeled models available as of October 2011 indicate the widespread availability and commercial viability of plumbing products that are more efficient than the federal minimum standards shown in Table 604.4:

- Tank-type water closets 886 models from 60 brands
- Lavatory faucets and accessories 809 models from 86 brands
- Urinals
  - 47 models of fixtures from 9 brands
  - 41 models of valves from 4 brands
- Showerheads 402 models from 28 brands

With the pace of introduction of new models that meet WaterSense specifications, it is reasonable to expect that these figures will be substantially larger by 2015.

Improving the water efficiency of water closets, urinals, shower heads, and lavatory faucets in new construction will save building owners money and reduce the likelihood of municipal water and wastewater capacity constraints that can lead to moratoria on new connections.

NRDC estimates that nationwide adoption of the revised values in this proposal, effective 2016, can be expected to save:

- 243.1 million gallons of water per day by 2030;
- More than 2.8 billion kilowatt hours per year by 2030;
- More than 178 hundred million therms of natural gas per year by 2030; and
- Consumers will realize more than $2.18 billion dollars in reduced energy and water costs.

Cost Impact: While the costs of plumbing fixtures and fittings vary greatly due to style, trim, colors, and materials, the incremental cost of greater efficiency alone for products meeting the flush volumes and flow rates contained in this proposal is negligible. This code change proposal will not increase the cost of construction.

P91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T604.4-P-OSANN

P92 – 12
604.5

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

604.5 Size of fixture supply. The minimum size of a fixture supply pipe shall be as shown in Table 604.5.The fixture supply pipe shall terminate not more than 30 inches (762 mm) from the point of connection to the fixture. A reduced size flexible water connector installed between the supply pipe and the fixture shall be of an *approved* type. The supply pipe shall extend to the floor or wall adjacent to the fixture. The minimum size of individual distribution lines utilized in gridded or parallel water distribution systems shall be as shown in Table 604.5.

Exceptions:

1. Where the developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the maximum fixture flow rate does not exceed 0.5 gpm (1.9 lpm), the minimum size of fixture supply pipe shall be 1/4 inch (6.4 mm).
2. Where the developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the maximum fixture flow rate does not exceed 1 gpm (3.8 lpm), the minimum size of fixture supply pipe shall be 5/16 inch (8 mm).
3. Where the developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the maximum fixture flow rate does not exceed 1.5 gpm (5.7 lpm), the minimum size of fixture supply pipe shall be 3/8 inch (9.5 mm).

Reason: The 2012 IGCC approved GEW 327 that contained a footnote to a table limiting the flow rate of hot or tempered water in small diameter piping (1/4, 5/16 and 3/8 inch) to 0.5, 1, and 1.5 gpm respectively. Putting a requirement in a footnote is not the best code language. The table also limited the length of these pipe diameters to 50 feet, or 50 feet of developed length, whichever is less (within the context of the 2012 IPC).

This proposal takes the requirement out of the footnote of a table and makes the flow rate and developed length requirements applicable to hot, tempered or cold-water distribution lines.

Why limit the maximum fixture flow rate when 1/4, 5/16 and 3/8 inch diameter piping is being used? The answer is that the flow rates were selected, using the Hazen-Williams formulas, to keep the velocity below 5 feet per second, which minimizes pressure drop, reduces noise and limits the rate of any internal corrosion. The same formulas were used to limit the pressure drop at these flow rates to not more than 5 psi in the 50 foot lengths of 1/4, 5/16 and 3/8 inch diameter piping.

Why limit the length of the small diameter tubing to 50 feet of developed length? The answer is that this restriction is necessary to correlate with the changes to Section 607.2 of the IPC that limited the distance between the source of hot or tempered water and the fixtures to no more than 50 feet of developed length. While this is particularly important in hot water supply piping, it is also a very reasonable restriction for cold water supply piping used for low flow rate fixtures. Pressure loss at lengths greater than 50 feet would be excessive and unacceptable, as would heat loss in the hot or tempered water supply piping. In addition, for the low flow rate fixtures used with the small diameter piping, limiting length to 50 feet reduces the time-to-tap and the amount of water wasted while waiting for hot or tempered water to arrive, thereby improving performance for the user as well as water and energy waste.

I urge your support for this proposal. Thank you.

Cost Impact: The code change proposal will not increase the cost of construction. In fact, if the smaller diameter piping becomes commonly used, it might decrease the costs of construction.

P92-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

604.5-P-KLEIN

P93 – 12
Table 604.5

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

TABLE 604.5
MINIMUM SIZES OF FIXTURE WATER SUPPLY PIPES

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE[a] (gpm)	FLOW PRESSURE (psi)

a. Where the developed length of the distribution line is ~~60~~ 50 feet or less, and the available pressure at the meter is 35 psi or greater, the minimum size of an individual distribution line supplied from a manifold and installed as part of a parallel water distribution system shall be one nominal tube size smaller than the sizes indicated.

(Portions of table not shown remain unchanged.)

Reason: Section 607.2 of the 2012 IPC limits the developed length of hot or tempered water supply piping to 50 feet.

The change recommended in this proposal correlates Table 604 with Section 607.2. It will apply to cold water as well as to hot or tempered water, which quite frankly is fine from the perspective of minimizing pressure drop and maintaining acceptable performance at the fixtures.

I urge your support for this proposal. Thank you.

Cost Impact: The code change proposal will not increase the cost of construction. In fact, if the smaller diameter piping becomes commonly used, it might decrease the costs of construction.

P93-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T604.5-P-KLEIN

P94 – 12
Table 605.3, Table 605.4, 605.17 (New)

Proponent: David W. Ash, Lubrizol Advanced Materials, Inc.

Revise as follows:

TABLE 605.3
WATER SERVICE PIPE

Chlorinated polyvinyl chloride/aluminum/ chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855

(Portions of table not shown remain unchanged)

TABLE 605.4
WATER DISTRIBUTION PIPE

Chlorinated polyvinyl chloride/aluminum/ chlorinated polyvinyl chloride (CPVC/AL/CPVC) pipe and tubing	ASTM F2855

(Portions of table not shown remain unchanged)

605.17 Chlorinated polyvinyl chloride/aluminum/ chlorinated polyvinyl chloride (CPVC/AL/CPVC) pipe and tubing. Joints between CPVC/AL/CPVC plastic pipe or CPVC fittings shall comply with Sections 605.17.1 and 605.17.2.

605.17.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

605.17.2 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an *approved* primer shall be applied. Solvent cement, orange in color and conforming to ASTM F 493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D 2846 or ASTM F 493. Solvent cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F 493.
2. The solvent cement used is yellow in color.
3. The solvent cement is used only for joining ½ inch (12.7 mm) through 2 inch (51 mm) diameter
   CPVC/AL/CPVC pipe and CPVC fittings.
4. The CPVC fittings are manufactured in accordance with ASTM D 2846.

Add new standard to Chapter 14 as follows:

ASTM
F2855-11 Specification for Poly(Vinyl Chloride)/Aluminum/Poly(Vinyl Chloride) (CPVC/AL/CPVC) Composite Pressure Tubing

Reason: CPVC/AL/CPVC pipe has been developed that is suitable for use as potable water piping, both as water service pipe and water distribution pipe. This product has been successfully used successfully on a limited basis since 2007 based on NSF standard 61 and a special engineering standard (SE) from NSF International. Including this product in the IPC will recognize another plumbing pipe option for installers.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 2855-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.3-P-ASH

P95 – 12

Table 605.3, Table 702.2, Table 702.3, Table 702.4, 705.3, Table 1102.5

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

TABLE 605.3
WATER SERVICE PIPE

MATERIAL	STANDARD
~~Asbestos-cement pipe~~	~~ASTM C296~~

(Portions of table not shown remain unchanged)

~~**605.11 Asbestos-cement.** Joints between asbestos-cement pipe or fittings shall be made with a sleeve coupling of the same composition as the pipe, sealed with an elastomeric ring conforming to ASTM D 1869.~~

(Renumber subsequent sections)

TABLE 702.2
UNDERGROUND BUILDING DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
~~Asbestos-cement pipe~~	~~ASTM C428~~

(Portions of table not shown remain unchanged)

TABLE 702.3
BUILDING SEWER PIPE

MATERIAL	STANDARD
~~Asbestos-cement pipe~~	~~ASTM C428~~

(Portions of table not shown remain unchanged)

TABLE 702.4
PIPE FITTINGS

MATERIAL	STANDARD
~~Asbestos-cement pipe~~	~~ASTM C428~~

(Portions of table not shown remain unchanged)

~~**705.3 Asbestos cement.** Joints between asbestos-cement pipe or fittings shall be made with a sleeve coupling of the same composition as the pipe, sealed with an elastomeric ring conforming to ASTM D 1869.~~

(Renumber subsequent sections)

TABLE 1102.4
BUILDING STORM SEWER PIPE

MATERIAL	STANDARD
~~Asbestos-cement pipe~~	~~ASTM C428~~

Portions of table not shown remain unchanged

TABLE 1102.5
SUBSOIL DRAIN PIPE

MATERIAL	STANDARD
~~Asbestos-cement pipe~~	~~ASTM C508~~

(Portions of table not shown remain unchanged)

Reason: Asbestos cement pipe is no longer manufactured in North America. The potential health issues associated with asbestos make this piping material unsuitable for use. The material needs to be removed from the code.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.3-P-STRAUSBAUGH.PMGCAC

P96 – 12
Table 605.5

Proponent: Robert Hall, SE Technical Manager, representing Viega, LLC (robert.hall@viega.com)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIALS	STANDARDS
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME 16.26; ASME B16.29; <u>ICC-ES LC1002</u>

(Portions of table not shown remain unchanged.)

Add standard to Chapter 14 as follows:

<u>ICC-ES</u>
<u>5360 Workman Mill Road</u>
<u>Whittier, California 90601</u>

<u>ICC-ES</u>

<u>LC1002</u> <u>Press-connection Fittings for Potable Water Tube and Radiant Heating Systems</u>

Reason: ICC Evaluation Services Standard for press-connect copper fittings.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ICC-ES LC1002, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P96-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5 #1-P-HALL

P97 – 12
Table 605.5, Chapter 14

Proponent: Robert Hall, SE Technical Manager, representing Viega, LLC (robert.hall@viega.com)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIALS	STANDARDS
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME 16.26; ASME B16.29; <u>ASME B16.51</u>

Add new standard to Chapter 14 as follows:

ASME
<u>B16.51-2011</u> <u>Copper and Copper Alloy Press-Connect Pressure Fittings</u>

Reason: New, ASME Material Standard for Press-Connect fittings.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASME B16.51-2011, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P97-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5 #2-P-HALL

P98 – 12
Table 605.5, Chapter 14

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing himself (JBEngineer@aol.com)

Revise as follows:

TABLE 605. 5
PIPE FITTINGS

MATERIAL	STANDARDS
Copper or copper alloy	ASSE 1061; ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29, <u>ASME B16.51</u>

(Portions of table not shown remain unchanged)

Add new standard to Chapter 14 as follows:

ASME
<u>B16.51-2011</u> <u>Copper and Copper Alloy Press-Connect Pressure Fittings</u>

Reason: This adds the new standard for copper press connect fittings. ASME B16.51 was published in December 2011. The standard regulates the size, design, and performance requirements for press connect fittings.

Cost Impact: This change does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME B16.51-2011 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P98-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5-P-BALLANCO

P99 – 12
Table 605.5

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing The Copper Development Association (penniefeehan@me.com)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Copper or copper alloy	ASSE 1061; ASME B16.15; ASME B16.18; ASME B16.22; ~~ASME B16.23;~~ ASME B16.26; ~~ASME B16.29~~

Reason: The above proposal removes DWV fittings from Potable Water table to benefit the end user. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV and ASME B 16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV are designed with short cup depth and ¼ inch per foot slope. Both Standards are listed correctly under DWV fittings in Table 704.2 and Chapter 14 Reference Standards.

Cost Impact: This code change will not increase the cost of construction.

P99-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5-P-FEEHAN

P100 – 12

Table 605.5

Proponent: Larry Gill, P.Eng. IPEX USA LLC (larry.gill@ipexna.com)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 1807; ASTM F 2098; ASTM F 2159; ASTM F 2735; <u>ASTM F2769</u>

Reason: I am adding standard ASTM F2769 (already in the code) to the pipe fittings table because the standard includes fittings for PE-RT tubing. This standard should have added to this table during the last cycle when the standard was first introduced into the code for Tables 605.3 and 605.4.

Cost Impact: The proposed change will not increase the cost of construction

P100-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5 #2-P-GILL

P101 – 12
Table 605.5, Chapter 14

Proponent: Kevin Simko, Victaulic representing Victaulic (ksimko@victaulic.com)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIALS	STANDARDS
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME 16.26; ASME B16.29; ASTM B 75: ASTM B 152; ASTM B 584
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A 536; ASTM F 1476: ASTM F 1548
Stainless steel (Type 304/304L)	ASTM A 312; ASTM A 778; ASTM A 351; ASTM A403: ASTM A 743; ASTM A 744; ASTM A 890
Stainless steel (Type 316/316L)	ASTM A 312; ASTM A 778; ASTM A 351; ASTM A 403: ASTM A 743; ASTM A 744; ASTM A 890
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM A 53; ASTM A 106; ASTM A 234; ASTM A 395; ASTM A 536; ASTM F1476; ASTM F1548

(Portions of table not shown remain unchanged.)

Add new standards to Chapter 14 as follows:

ASTM

A106/A106M-11	Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
A234/A234M-11a	Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
A 351-10	Standard Specification for Castings, Austenitic, for Pressure-Containing Parts
A 395/A395M-99(2009)	Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
A 403-11	Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings
A 536-84(2009)	Standard Specification for Ductile Iron Castings
A 743/A743M-06(2010)	Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application
A 744/A744M-10e1	Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service
A 890/A890M-10	Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application
B 584-11	Standard Specification for Copper Alloy Sand Castings for General Applications
F 1476-07	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications

F1548-01(2006) Standard Specification for the Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications

Reason: The materials currently listed in Table 605.5 do not fully represent the materials being used for potable water systems in the industry. The code is overly-restrictive with regard to pipe materials and does not allow for the use of materials that offer improved mechanical and electrochemical properties compared with allowed materials. The additions of the standard materials will allows the use of high grade materials that provide improved performance. ,amy of these materials are also currently used in the International Mechanical Code and other piping codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ASTM A106/A106M-11, ASTM A234/A234M-11a, ASTM A 351-10, ASTM A 395/A 395M-99(2009), ASTM A 403-11, ASTM A536-84(2009), ASTM A536-84(2009), ASTM B584-11, ASTM A 743/A 743M-06(2010)m ASTM A 744/A 744M-10e1, ASTM A890/A890M-10, ASTM F 1476-07 and ASTM F 1548-01(2006), with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P101-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5-P-SIMKO

P102 – 12
Table 605.5

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee (Sstrausbaugh@arlingtonva.us)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Cast-iron	ASME B16.4~~; ASME B16.12~~

(Portions of table not shown remain unchanged)

Reason: ASME B16.12 is for threaded *drainage* fittings and is inappropriate in a water distribution pipe fitting table.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P102-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5-P-STRAUSBAUGH.PMGCAC

P103 – 12

605.14, 605.14.1, 605.14.2, 605.14.3, 605.14.4, 605.14.5, 605.14.6 (New), 605.14.7 (New), 605.14.8 (New), 605.15

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting representing The Copper Development Association (penniefeehan@me.com)

Revise as follows:

605.14 Copper pipe and tubing. Joints between copper or copper-alloy pipe, tubing, and ~~or~~ fittings shall comply with Sections 605.14.1 through 605.14.~~5~~8.

605.14.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with a brazing alloy having a liquid temperature exceeding 1000˚F (538˚C). ~~All~~ Joint surfaces to be brazed shall be cleaned bright by manual or mechanical means. The ends of pipe or tubing shall be cut square and shall be reamed to the full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Where required by the brazing alloy manufacturer's instructions, an approved brazing flux shall be applied to the joint surfaces. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

605.14.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall include compression type, flanged type, grooved type and press type.

605.14.3 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ The ends of pipe or tub~~e~~ing shall be cut square and shall be reamed to the full inside diameter of the pipe or tub~~e~~ing. ~~end.~~ Burrs on the outside end of the pipe or tubing shall be removed. ~~All~~ Joint surfaces to be soldered shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to the pipe or tubing and fittings. Such flux shall be noncorrosive and nontoxic after soldering. ~~be applied.~~ Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air /fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and the pipe or tubing. Solder in compliance with ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. ~~The joint shall be soldered with a solder conforming to ASTM B 32.~~ The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint.

605.14.4 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

605.14.5 Welded joints. ~~All~~ Welded joint surfaces shall be cleaned. The joint shall be welded with ~~an~~ *approved* filler metal.

605.14.6 Flared joints. Flared joints for water pipe shall be made by a tool designed for that operation.

605.14.7 Push-Connect joints. Removable and non-removable push fit fittings for copper tubing or pipe shall comply with ASSE 1061. Push fit fittings for copper pipe or tubing shall have an *approved* elastomeric O-ring that seals the joint. The end of pipe or tubing shall be cut square, chamfered and reamed to full inside diameter. The pipe or tubing shall be fully inserted into the fitting and the pipe or tubing shall be marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the pipe or tubing to verify that the pipe or tubing is fully inserted into the fitting and the gripping mechanism has engaged on the pipe or tube.

605.14.8 Pressed-Connect joints. Pressed fittings for copper pipe or tubing shall have an elastomeric O-ring that seals the joint. The pipe or tubing shall be fully inserted into the fitting, and the pipe or tubing shall be marked at the shoulder of the fitting. Pressed fittings for copper pipe or tubing shall have an *approved* elastomeric O-ring that forms the joint. The ends of pipe or tubing shall be cut square, chamfered and reamed to full inside diameter. The fitting alignment shall be checked against the mark on the pipe or tubing to verify that the pipe or tubing is fully inserted into the fitting. The joint shall be pressed using the tool recommended by the manufacturer of the press fitting.

~~**605.15 Copper tubing.** Joints between copper or copper alloy tubing or fittings shall comply with Sections 605.15.1 through 605.15.4.~~

~~**605.15.1 Brazed joints.** Joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.~~

~~**605.15.2 Flared joints.** Flared joints for water pipe shall be made by a tool designed for that operation.~~

~~**605.15.3 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

~~**605.15.4 Soldered joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with lead-free solders and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.~~

(Renumber subsequent sections)

Reason: The above language combines pipe and tubing into one section and provides the joining methods of copper and copper alloys as referenced in Table 605.5. In addition, important language from the standards has been added to aid the end user.

Cost Impact: This code change will not increase the cost of construction.

P103-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.14-P-FEEHAN

P104 – 12

605.15, 605.15.4 (New)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self (JBEngineer@aol.com)

Revise as follows:

605.15 Copper tubing. Joints between copper or copper alloy tubing or fittings shall comply with Sections 605.15.1 through ~~605.15.4~~ 605.15.5.

605.15.1 Brazed joints. Joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

605.15.2 Flared joints. Flared joints for water pipe shall be made by a tool designed for that operation.

605.15.3 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

605.15.4 Press connect. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. The tube shall be fully inserted into the press connect fitting. Press connect joints shall be pressed with a tool certified by the manufacturer.

~~605.15.4~~ 605.15.5 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with lead-free solders and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.

Reason: This change coordinates with the change to add the press connect fitting standard to Table 605.5. The proposed new text identifies the method of joining copper tube by press connect. The tube must be cut square and reamed. The tool must be certified by the manufacturer to assure that the proper press connection is made.

Cost Impact: This change does not increase the cost of construction.

P104-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.15-P-BALLANCO

P105 – 12

605.15.3 (New), Chapter 14

Proponent: Kevin Simko, Victaulic, representing Victaulic (ksimko@victaulic.com)

Add new text as follows:

605.15.3 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be permitted to be concealed.

Add new standard to Chapter 14 as follows:

ASTM

ASTM F1476-07	Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications

Reason: The code as written contains no provision specifically identifying grooved and shoulder mechanical joints. These types of joints are acceptable within the International Mechanical Code with the same verbiage. These type sof joints are commonly used in steel, stainless steel, copper and PVC potable water systems when incorporating a gasket that meets the requirements of the NSF 61. Without this provision, the current code is not representative of current materials and methods.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F1476-07 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P105-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.15.3 (NEW)-P-SIMKO

P106 – 12
605.15.5 (New)

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Add new text as follows:

605.15.5 Press Connect Joints. Press connect joints shall be installed in accordance with the manufacturer's instructions. Press-connect joints shall conform to one of the standards listed in Table 605.5

Reason: Need press connect fittings reference in Section 605.15 Copper tube.

Cost Impact: None

P106-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.15.5 (NEW)-P-HALL

P107 – 12
605.16.2

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self (JBEngineer@aol.com)

Revise as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture~~,~~. Joints shall be made in accordance with the pipe manufacturer's installation instructions. Where such instructions require ~~and~~ that ~~an~~ ~~*approved*~~ primer be used, the primer shall be applied to the joint surfaces and a solvent cement, orange in color and conforming to ASTM F 493, shall be applied to the joint surfaces. Where such instructions allow for a one step solvent cement, yellow in color and conforming to ASTM F 493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet and in accordance with ASTM D 2846 or ASTM F 493. Solvent cemented joints shall be permitted above or below ground.

~~**Exception:** A primer is not required where all of the following conditions apply:~~

1. ~~The solvent cement used is third-party certified as conforming to ASTM F 493.~~
2. ~~The solvent cement used is yellow in color.~~
3. ~~The solvent cement is used only for joining ½ inch (12.7 mm) through 2 inch (51 mm) diameter CPVC pipe and fittings.~~
4. ~~The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846.~~

Reason: This section is currently very convoluted. The requirements can be simplified by referencing the pipe manufacturer's installation instructions. The installation instructions are part of the listing which is required by the code. This will also recognize changes to the listing of the joining method, rather than requiring constant changing of this section.

The current requirements are incorrect since UL lists ASTM F442 for joining with one-step solvent cement. Furthermore, UL lists the joining for pipe up to 3 inch in diameter. Neither requirement is addressed in the current code text.

Cost Impact: This change does not increase the cost of construction.

P107-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.16.2-P-BALLANCO

P108 – 12
605.16.2

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self (JBEngineer@aol.com)

Revise as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an approved primer shall be applied. Solvent cement, orange in color and conforming to ASTM F 493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D 2846 or ASTM F 493. Solvent cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F 493.
2. The solvent cement used is yellow or red in color.
3. The solvent cement is used only for joining ½ inch (12.7 mm) through 2 inch (51 mm) diameter
   CPVC pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846 or ASTM F442.

Reason: ASTM F442 CPVC is used in sprinkler systems, as well as, plumbing systems. With the use of multipurpose piping systems in one and two family dwellings and townhouses, it has become common to see both ASTM F442 and ASTM D2846 pipe being installed. UL has listed ASTM F442 pipe for joining with one step solvent cement. However, UL requires the solvent cement to be red in color. The yellow and red one step solvent cement are the same, other than the color. This will allow the use of a single color solvent cement when doing a multipurpose residential sprinkler installation.

Cost Impact: This change does not increase the cost of construction.

P108-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.16.2-P-BALLANCO

P109 – 12
605.18.3 (New), Chapter 14

Proponent: Kevin Simko, Victaulic representing Victaulic (ksimko@victaulic.com)

Add new text as follows:

605.18.3 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be permitted to be concealed.

Add new standard to Chapter 14 as follows:

ASTM

ASTM F1476-07	Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications

Reason: The code as written contains no provision specifically identifying grooved and shoulder mechanical joints. These types of joints are acceptable within the International Mechanical Code with the same verbiage. These type sof joints are commonly used in steel, stainless steel, copper and PVC potable water systems when incorporating a gasket that meets the requirements of the NSF 61. Without this provision, the current code is not representative of current materials and methods.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 1476-07 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P109-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.18.3 (NEW)-P-SIMKO

P110 – 12
202, 605.2

Proponent: Jeremy Brown, NSF International (Jeremy@nsf.org)

Revise as follows:

LEAD-FREE PIPE AND FITTINGS. ~~Containing not more than 8.0 percent lead~~ Pipe and fittings where the wetted surfaces of such pipe and fittings have a weighted average lead content of 0.25 percent or less.

605.2 Lead content of water supply pipe and fittings. Pipe and pipe fittings, including valves and faucets, utilized in the water supply system and providing water for human consumption shall ~~have a maximum of 8% lead content~~ be lead-free.

Reason: Section 1417 of the Safe Drinking Water Act (42 U.S.C. 300g–6) was amended by Senate Bill.3874 of 2010 http://www.gpo.gov/fdsys/pkg/BILLS-111s3874enr/pdf/BILLS-111s3874enr.pdf This changes the definition of lead free in the Safe Drinking Water Act from not more than 8 percent lead to not more than a weighted average of 0,25 percent. The effective date of the SDWA revision is January 4, 2014. This proposal makes the corresponding adjustment to the definitions and code section.

Cost Impact: This will not increase the cost of construction.

P110-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.2-P-BROWN

P111 – 12
202, 605.2, 605.2.1 (New), 605.14.3, 605.15.4

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Delete the following definitions without substitution:

~~**LEAD-FREE PIPE AND FITTINGS.** Containing not more than 8.0-percent lead.~~

~~**LEAD-FREE SOLDER AND FLUX.** Containing not more than 0.2-percent lead.~~

Revise as follows:

605.2 Lead content of water supply pipe and fittings. <u>The wetted surfaces of</u> pipe and pipe fittings, including valves and faucets, utilized in the water supply system shall have ~~a maximum of 8 -percent~~ <u>not more than a weighted average of 0.25 percent lead.</u>

<u>**605.2.1 Calculation.** The weighted average lead content of pipe and pipe fitting, plumbing fittings, valves and faucets shall be calculated in accordance with this section: For the purposes of this section and Section 605.2, a wetted surface is defined as a surface that is in contact with the water that it contains. To determine the weighted percentage of lead of each wetted component, the percentage of lead in that component shall be multiplied by the ratio of the wetted surface area of that component to the total wetted surface area of the entire product. The weighted percentages of lead of each of the wetted components shall be added together and the sum of the weighted percentages shall constitute the weighted average lead content of the product. The lead content of the material used to produce wetted components shall be used to determine compliance with Section 605.2. For the lead content of materials that are provided as a range, the maximum content of the range shall be used.</u>

605.14.3 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with ~~lead-free~~ solder and fluxes~~. "Lead free" shall mean a~~ <u>having a</u> chemical composition equal to or less than 0.2-percent lead.

605.15.4 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with ~~lead-free~~ solders and fluxes~~. "Lead free" shall mean~~ <u>having</u> a chemical composition equal to or less than 0.2-percent lead.

Reason: The Safe Drinking Water Act (42 U.S.C. 300g–6) was amended by Senate Bill.3874 of 2010 http://www.gpo.gov/fdsys/pkg/BILLS-111s3874enr/pdf/BILLS-111s3874enr.pdf This amendment changes the definition of lead free in the Safe Drinking Water Act from not more than 8 percent lead to not more than a weighted average of 0.25 percent for wetted surfaces. The effective date of the SDWA revision is January 4, 2014. Accepting this change will align the IPC with Federal requirements.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P111-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.2-P-STRAUSBAUGH.PMGCAC

P112 – 12
605.2.1 (New), Chapter 14

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Add new text as follows:

605.2.1 Lead content of drinking water pipe and fittings. Pipe, pipe fittings, joints, valves, faucets, and fixture fittings utilized to supply water for drinking or cooking purposes shall comply with NSF 372 and shall have a weighted average lead content of 0.25 percent lead or less.

Add new standard to Chapter 14 as follows:

NSF
372-2010 Drinking Water System Components - Lead Content

Reason: This change will coordinate the IPC with Federal legislation limiting the amount of lead that can be used to supply drinking water. Section 605.2 is still necessary since remaining components in a potable water distribution system must still have a maximum of 8 percent lead. The Federal legislation only applies to drinking water components. There are other components that have a greater quantity of lead than 0.25 percent and are permitted to by Federal law.

NSF 372 is the new standard used to evaluate the weighted average of lead in drinking water components. This standard allows manufacturers to perform a mathematical analysis of their product to determine the weighted average of lead. NSF 372 is consistent with the Federal legislation.

Cost Impact: This change does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NSF 372-2010 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P112-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.2.1 (NEW)-P-BALLANCO

P113 – 12
605.5

Proponent: Kevin Simko, Victaulic representing Victaulic (ksimko@victaulic.com)

Revise as follows:

605.5 Fittings. Pipe fittings shall be *approved* for installation with the piping material installed and shall comply with the applicable standards listed in Table 605.5. Pipe fittings utilized in water supply systems shall also comply with NSF 61. Ductile and gray iron pipe <u>and pipe fittings utilized within water service piping systems</u> shall be cement mortar lined in accordance with AWWA C104.

Reason: The code as written requires that any fitting manufactured from ductile iron must be cement lined. This ambiguity results in overly-restrictive fitting requirements that do not represent current materials and methods. The requirement for cement lining needs to be specific for water service pipe and not distribution piping. Distribution piping typically incorporates galvanized steel of ductile iron components and not cement lining. Cement lining is used exclusively in ductile iron water main piping.

Cost Impact: The code change proposal will not increase the cost of construction.

P113-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.5-P-SIMKO

P114 – 12
605.5.1.3 (New), 605.9

Proponent: Kevin Simko, Victaulic, representing Victaulic (ksimko@victaulic.com)

Revise as follows:

<u>**605.5.1.3 Mechanical joints for branch lines.** Mechanical joints that are used to create branch lines of a pipe run shall incorporate a locating collar that is designed for alignment and prevention of the rotation of the mechanical joint after installation. The locating collar shall extend into a predrilled hole in the pipe. The mechanical joint shall be installed in accordance with the manufacturer's instructions. Sealing of the joint shall be made with an *approved* elastomeric seal.</u>

605.9 Prohibited joints and connections. The following types of joints and connections shall be prohibited:

1. Cement or concrete joints.
2. Joints made with fittings not *approved* for the specific installation.
3. Solvent-cement joints between different types of plastic pipe.
4. Saddle-type fittings.

   <u>**Exception:** Mechanical joints in accordance with Section 605.5.1.3 and used for branch line connections shall be permitted.</u>

Reason: There is no provision in the IPC allowing or preventing the use of mechanical joints for branch lines. Mechanical joints for branch lines are used in HVAC and other applications not in the scope of the IPC. Mechanical joints for branch lines offer improved performance and safety compared with saddles, Materials are the same used in other acceptable products.

Cost Impact: The code change proposal will not increase the cost of construction.

P114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.5.1.3-P-SIMKO

P115 – 12
605.7

Proponent: Jeremy Brown, NSF International (brown@nsf.org)

Revise as follows:

605.7 Valves. All valves shall be of an approved type and compatible with the type of piping material installed in the system. ~~Ball valves, gate valves, butterfly valves, globe valves and plug.~~ Valves intended to supply drinking water shall meet the requirements of NSF 61.

Reason: NSF/ANSI Standard 61 Drinking Water System Components-Health Effects addresses crucial aspects of drinking water system components: whether contaminants that leach or migrate from the product/material into the drinking water are above acceptable levels in finished waters. Requiring NSF 61 will help protect the drinking water supply from the leaching of contaminants. The IPC and IRC already requires conformance to NSF 61 for pipes, fittings, faucets and valves intended to supply drinking water. (Sections 424.1, 605.3, 605.4, 605.5, 605.7 of IPC).

The current list of valves in Section 605.7 which require NSF-61 was a concession during previous code change cycles to allow manufacturers time to bring product lines into compliance with this standard. The requirement should apply to all valves intended to supply drinking water. The Uniform Plumbing Code currently requires all valves to conform to NSF 61.

Cost Impact: This will not increase the cost of construction.

P115-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.7 # 1-P-BROWN

P116 – 12
605.7, Table 605.7 (New), Chapter 14

Proponent: Jeremy Brown, NSF International (brown@nsf.org)

Revise as follows:

605.7 Valves. ~~All~~ Valves shall be ~~of an approved type and~~ compatible with the type of piping material installed in the system. Valves shall conform to one of the standards listed in Table 605.7 or shall be *approved*. Ball valves, gate valves, globe valves and plug valves intended to supply drinking water shall meet the requirements of NSF 61.

TABLE 605.7
VALVES

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic	ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASTM F 1970, CSA B125.3
Copper or copper alloy	ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASME B16.34, CSA B125.3, MSS SP-67, MSS SP-80
Ductile Iron	ASTM A126, AWWA C500, AWWA C504, AWWA C507, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78, MSS SP110,
Cross-linked polyethylene (PEX) plastic	ASME A112.4.14, ASME A112.18.1, CSA B125.3, NSF 359
Polypropylene (PP) plastic	ASTM F 2389
Polyvinyl chloride (PVC) plastic	ASME A112.4.14, ASTM F 1970

Add new standards to Chapter 14 as follows:

ASME
A112.4.14 – 2004 Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems
B16.34 – 2009 Valves Flanged, Threaded and Welding End

ASTM
A126-04(2009) Gray Iron Castings for Valves, Flanges, and Pipe Fittings
F1970 - 05 Special Engineered Fittings, Appurtenances or Valves for use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems

AWWA
C500-09 AWWA Standard for Metal-Seated Gate Valves for Water Supply Service
C504-10 AWWA Standard for Rubber-Seated Butterfly Valves
C507-11 AWWA Standard for Ball Valves, 6 In. Through 60 In.

MSS
Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.
127 Park Street, N.E.
Vienna, VA 22180

SP-42-2009 Corrosion Resistant Gate, Globe, Angle and Check Valves with Flanged and Butt Weld Ends (Classes 150, 300 & 600)

SP-67-2011 Butterfly Valves
SP-70-2011 Gray Iron Gate Valves, Flanged and Threaded Ends
SP-71-2011 Grey Iron Swing Check Valves, Flanged and Threaded Ends
SP-72-2010 Ball Valves with Flanged or Butt-Welding Ends for General Service

SP-78-2011 Cast Iron Plug Valves, Flanged and Threaded Ends
SP-80-2008 Bronze Gate, Globe, Angle and Check Valves
SP-110-2010 Ball Valves, Threaded, Socket Welded, Solder Joint, Grooved and Flared Ends

NSF
359-2011 Valves for Crosslinked Polyethylene (PEX) Water Distribution Tubing Systems

Reason: Currently the code requires valves to be approved but does not contain requirements for which performance standards are acceptable for use. While a number of valve standards have been created over the years, they have not been included in the code. The intent of this code change is to create a table to identify appropriate standards for valves. This list is not all inclusive of all material types and in some cases there are not national standards for every type of valve and material used. For this reason, the language “shall be approved or conform to . . .”

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ASME A112.4.14–2004 , ASME B16.34–2009 , ASTM A126-04(2009), ASTM F1970-05, AWWA C500-09, AWWA C504-10, AWWA C507-11, MSS SP-42-2009, MSS SP-67-2011, MSS SP-70-2011, MSS SP-71-2011, MSS SP-72-2010, MSS SP-78-2011, MSS SP-80-2008, MSS SP-100-2010 and NSF 359-2011 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P116-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.7 #2-P-BROWN

P117 – 12
605.7.1 (New), Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Add new text as follows:

605.7.1 Quarter-turn shut-off valves. Manually operated, quarter-turn shut off valves, 2 inches (51mm) or less in size, shall conform to ASME A112.4.14.

Add new standard to Chapter 14 as follows:

ASME

A112.4.14–2004(R2010)	Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems

Reason: ASME A112.4.14 Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems is a National standard (ANSI). These valves are intended for indoor installation as potable water shutoff valves between the meter and the supply stop. Valves governed by this Standard are intended for service at temperatures between 34°F (1°C) and 180°F (82°C), with an allowable working pressure rating not less than 125 psi (862 kPa).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.14-2004(R2010) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P117-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.7.1 (NEW)-P-CONSTANTINO

P118 – 12

NUMBER NOT USED

P118-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

P119– 12
605.22.2 (New), Chapter 14

Proponent: Kevin Simko, Victaulic representing Victaulic (ksimko@victaulic.com)

Add new text as follows:

605.22.2 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be permitted to be concealed.

Add new standard to Chapter 14 as follows:

ASTM

ASTM F1476-07	Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications

Reason: The code as written contains no provision specifically identifying grooved and shoulder mechanical joints. These types of joints are acceptable within the International Mechanical Code with the same verbiage. These type sof joints are commonly used in steel, stainless steel, copper and PVC potable water systems when incorporating a gasket that meets the requirements of the NSF 61. Without this provision, the current code is not representative of current materials and methods.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 1476-07 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P119-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.22.2 (NEW)-P-SIMKO

P120 – 12
605.23.3 (New), Chapter 14

Proponent: Kevin Simko, Victaulic representing Victaulic (ksimko@victaulic.com)

Add new text as follows:

605.23.3 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall comply with ASTM F1476, shall be made with an *approved* elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be permitted to be concealed.

Add new standard to Chapter 14 as follows:

ASTM

ASTM F1476-07 Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications

Reason: The code as written contains no provision specifically identifying grooved and shoulder mechanical joints. These types of joints are acceptable within the International Mechanical Code with the same verbiage. These type sof joints are commonly used in steel, stainless steel, copper and PVC potable water systems when incorporating a gasket that meets the requirements of the NSF 61. Without this provision, the current code is not representative of current materials and methods.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 1476-07 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P120-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.23.3 (NEW)-P-SIMKO

P121– 12
605.24.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

605.24.2 Plastic pipe or tubing to other piping material. Joints between different ~~grades~~ types of plastic pipe or between plastic pipe and other piping material shall be made with ~~an~~ *approved* adapters or transition fittings.

Reason: There is a number of different grades of plastic within a type of plastic pipe. For example, PVC can be made from various grades of PVC. All grades of PVC are solvent welded in the same manner with the same cement. This section is concerned with joints between different types of plastic pipe such as between PVC and ABS. These two different types of pipe cannot be directly joined together because the solvent cement approved for one type is not suitable for the other type. This corresponding section in the IRC was corrected many cycles ago and for uniformity, the IPC needs the same correction.

The term "transition" was added because some manufacturers provide special fittings for the purpose of joining two different types of plastic pipe.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P121-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.24.2-P-STRAUSBAUGH.PMGCAC

P122 – 12
605.25.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

~~**605.25.1 Flared joints.** Flared pipe ends shall be made by a tool designed for that operation.~~

(Renumber subsequent sections)

Reason: Manufacturers of PE-RT tubing indicate that the tubing cannot be flared and that a tool for flaring this type of tubing does not exist.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P122-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.25.1-P-STRAUSBAUGH.PMGCAC

P123 – 12

605.26 (New), Chapter 14

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

605.26 Brass fittings and brass valves for plastic piping systems. Where used as components of plastic piping systems and where made from copper alloys, brass fittings and brass valves shall comply with NSF14.

Reason: Dezincification of yellow brass piping components has become a real problem. There are 32,000 houses in Las Vegas that are being re-piped at a cost in excess of over $300 million due to dezincification of brass fittings in PEX domestic water systems. It is also occurring in other parts of the country (southern California and Hawaii to name just two). This also occurs in brass valves. 20 years ago Nibco had this problem when they started making brass valves in Taiwan. They figured out what they were doing wrong and it stopped. Now we have all these products being made abroad and the problem has come back times 10 or even 100.

The ASTM standards for these products allow several different alloys and since the codes are not specific as to which alloy to use for what, some manufacturers choose the least expensive one. Some of these alloys require more copper and allow less zinc (red brasses having the least amount of zinc) and other alloys require less copper and allow more zinc (yellow brasses). A poorly made yellow brass valve may be ok on a domestic water line in Chicago, or a drain line or air line or even a condenser water line in Las Vegas or San Diego. However, it will certainly fail in short order in a domestic water line in Las Vegas or San Diego or Honolulu. It is all about the local water and quality of the brass valve or PEX fitting. The brass valves and fittings that are failing meet the current codes. You can't treat the water because people drink it. The only solution is to regulate better through the codes and local enforcement.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Analysis: This code change proposal references NSF Standard 14, which is already referenced in the code. However, the proposed change to code text is written to correlate with a new edition of the standard NSF Standard 14-2010a, rather than the edition presently referenced in the code, which is the 2008e edition. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved, the code text will revert to the text as it appears in the 2012 Edition of the Code.

P123-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.26-P-STRAUSBAUGH.PMGCAC

P124–12

606.1 (New), Chapter 14

Proponent: Rand H Ackroyd, Rand Technical Consulting LLC, representing self (rackroyd@comcast.net)

Add new text as follows:

606.1 Quarter-turn full-open valves. Full open valves that are 2 inches and smaller shall be quarter-turn valves. Such valves shall comply with ASME A112.4.14.

(Renumber subsequent sections)

Add new standard to Chapter 14 as follows:

ASME

A112.4.14-2004 Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems.

Reason: ASME A112.4.14 Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems is a National standard(ANSI) These valves are intended for indoor installation as potable water shutoff valves between the meter and the supply stop. Valves governed by this Standard are intended for service at temperatures between 34°F (1°C) and 180°F (82°C), with an allowable working pressure rating not less than 125 psi (862 kPa).

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.14-2004 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P124-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

606.1 (NEW)-P-ACKROYD

P125 – 12
606.1.1 (New)

Proponent: Andrew Scott Jones, President, A Better Deal Heating and Air Conditioning, Inc., a Texas Corporation, representing self (tfkolter@gmail.com)

Add new text as follows:

606.1.1 Leak monitor. Where new piping is installed or piping is replaced, a device or system to monitor for water leaks shall be provided. Such device ot systems shall automatically shut off the water upon detection of a leak.

Reason: Flood damage in buildings resulting from undetected and uncontrolled water leaks is substantial and can be largely eliminated with an automatic supply shut-off valve and leak detection system. Likewise, an uncontrolled gas leaks present a danger to life, and can be largely eliminated if residential properties were protected with an automatic shut off valve and leak detection system.

Many such systems are available on the market at varying costs with a variety of leak detection and shut-off designs. This proposal is limited to new construction and to total refit of plumbing and gas systems, not repairs.

Cost Impact: The code change will increase the cost of construction, totaling an estimated $300.00 to $500.00 per unit, cost to the contractor.

P125-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

606.1.1 (NEW)-P-JONES

P126 – 12

202, 606.8 (New), 606.8.1 (New), 606.8.2 (New)

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Add new definitions as follows:

WATER METER. A device that measures the volume of water supplied from a public water main to a building or to an irrigated landscape and that is used by a public water supplier to bill for water.

WATER SUB-METER. A device, other than a *water meter*, installed on a water distribution pipe or makeup water pipe that measures the volume of water supplied to a specified space or specified equipment within a building or at the building site.

Add new text as follows:

606.8 Water measurement required for multi-family residential occupancies. The volume of water supplied to buildings of R-2 residential occupancy or a mixed-use occupancy that includes an R-2 residential occupancy shall be measured as required by Sections 606.8.1 and 606.8.2.

606.8.1 Sub-meters for individual multi-family dwelling units. *Water sub-meters* shall be installed to measure the volume of water supplied to each dwelling unit. *Water sub-meters* shall be installed in accordance with the manufacturer's instructions. Where point of use *water sub-meters* capable of communicating water consumption data remotely are installed at every fixture within the dwelling unit, a dwelling unit *water sub-meter* shall not be required.

> **Exception**: *Water sub-meters* shall not be required for dormitories, fraternities, sororities, and boarding houses (non-transient).

606.8.2 Sub-meters for water features and landscaped areas. A *water sub-meter* shall be installed to measure the volume of water supplied to an outdoor water feature or to an automatically controlled irrigation system serving irrigated landscapes having a combined area exceeding 2,500 ft^2 (232 m^2). Such *water sub-meter* shall be installed in accordance with the manufacturer's instructions.

> **Exception:** A *water sub-meter* shall not be required for an irrigated landscape that is supplied through a *water meter* dedicated to the landscape irrigation system.

Reason: This proposal requires the installation of water sub-meters for individual units in newly constructed apartment buildings. Public water suppliers typically do not install meters of their own on water supply piping to individual units, and occupants typically pay for water and sewer service as part of their rent or condominium fee.

Sub-metering in new multi-family buildings, when used for allocating the cost of water and wastewater service to individual dwelling units, ensures that water users receive an appropriate signal regarding the volume and cost of their water use, and thus incentivizes residents to undertake responsible water use and prompt reporting of fixtures in need of repair. Sub-metering is also useful in identifying leakage or unintended use in unoccupied dwelling units within multifamily buildings.

The National Multiple Family Sub-metering and Allocation Study (2004), sponsored by the US EPA and thirteen public water suppliers in different parts of the country, demonstrated that sub-metering reduces indoor water consumption substantially, by about 16% or 7,960 gallons per household unit per year, as a mid-range estimate. Nationwide, an estimated 5.9 million additional households will be living in multifamily housing by 2030 compared with 2015 (US Energy Information Agency, *Annual Energy Outlook 2011*, Residential Sector Key Indicators and Consumption, Reference Case). If beginning in 2016 all new multifamily housing is equipped with sub-meters used for billing allocation, even a conservative savings estimate of 3,110 gallons per unit per year (the value at the lower bound of the confidence band of the 2004 National Study estimate) yields water savings of 388 million gallons per day by 2030. Additionally, the measurement of water used for landscape purposes and for outdoor water features, such as swimming pools, ornamental ponds, and fountains, is essential to the effective management and avoidance of waste in large landscape maintenance.

Cost Impact: The estimated cost to install a sub-meter in new construction is $175. The National Multiple Family Sub-metering and Allocation Study cites $150 per meter. Additionally, according to Northland Investment Corp, water sub-meters can be installed for $125 to $175 per meter (see http://www.allbusiness.com/real-estate-rental-leasing/real-activities-related-to-real/680669-1.html) and as per the City of San Diego, it costs $150 - $300 per unit to install sub-meters in new construction (See http://www.sdnn.com/sandiego/2010-04-02/politics-city-county-government/city-council-to-consider-new-water-meter-rules#ixzz0jyvjUjrD). However, installation of sub-meters to allocate the cost of the building's water and wastewater service to individual occupants removes these utility costs from the owner's income statement and effectively increases the net cash flow and capitalized value of each rental unit.

P126-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

606.8-P-OSANN

P127 – 12
607.1.2 (New), 607.1.3 (New)

Proponent: Ron George, CPD, Plumb-Tech Design & Consulting Services LLC, representing self (Ron@Plumb-TechLLC.com)

Add new text as follows:

607.1.2 Master water temperature-actuated mixing valves. Where a master water temperature-actuated mixing valve is installed to control the hot water temperature to specified limits, it shall be located at the water heater. The piping from the hot water outlet of the water heater to the mixing valve shall have a mechanical heat trap installed or the piping shall be configured in a heat trap piping arrangement that drops not less than 24 inches (610mm) before rising to connect to the mixing valve. A shut off valve shall be installed in the piping before each inlet and after the outlet of the mixing valve. A water temperature indicating device shall be installed in the outlet of the valve or in the outlet piping and shall be located within six feet (1829 mm) of the outlet of the mixing valve. The mixing valve shall be sized for the maximum and minimum anticipated flows in accordance with the manufacturer's sizing instructions or generally accepted engineering practices. Master water temperature-actuated mixing valves shall comply with ASSE 1017 or CSA B125.3 and shall be installed in accordance with the manufacturer's instructions.

607.1.3 Point-of-use water temperature mixing valves. Point-of-use water temperature-actuated mixing valves installed for the purpose of limiting the water temperature at a sink, lavatory or group of lavatories shall comply with ASSE 1070. A shutoff valve shall be installed in the piping to each inlet of the mixing valve. The mixing valve shall be sized in accordance with the manufacturer's sizing instructions for the maximum and minimum anticipated flows. Point-of use water temperature mixing valves shall be installed in accordance with the manufacturer's installation instructions.

(Renumber subsequent section)

Reason: Language was needed addressing the installation of thermostatic mixing valves in domestic hot water systems. For master mixing valves a temperature gauge is needed to see what the valve is mixing to. For local mixing valves no temperature gauge is needed because water temperatures can be tested at a nearby fixture.

Cost Impact: The code change proposal will not increase the cost of construction. These mixing valve devices are not mandatory so there is no increase in cost. This code language gives guidance by listing the appropriate industry standards, shut-off valves and installation instructions to comply with only when these devices are installed.

P127-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.1.2-P-GEORGE

P128 – 12
607.2, 607.2.1 (New), Table 605.2.1 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

607.2 Hot or tempered water supply to fixtures. The piping ~~developed length of hot or tempered water piping~~, from the source of hot water to the fixture ~~that require hot or tempered water,~~ shall ~~not exceed~~ contain not more than 75 fluid ounces of water and shall be not more than 50 feet (15 240 mm) in length. Recirculating system piping and heat-traced piping shall be considered to be sources of hot or tempered water.

607.2.1 Pipe volumes. Table 605.2.1 shall be used to determine the water volume in piping.

TABLE 605.2.1
PIPING VOLUME

Size Nominal, Inch	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9
FLUID OUNCES OF WATER PER FOOT OF TUBE									
3/8”	1.06	0.97	0.84	N/A	1.17	N/A	0.64	0.63	0.64
1/2”	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18
3/4”	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35
1”	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	11.38	8.09	13.88	8.09
2”	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86

Reason: This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

The 2012 IPC limits the run of hot water lines in Section 607.2 to 50 feet. The IgCC, however, limits hot Reason: The 2012 IPC limits the run of hot water lines in Section 607.2 to 50’. The IgCC, however, limits hot water line length based on the volume in the pipe, therefore the maximum length is different for different sizes of pipe. The IPC should be revised to better correspond with the IgCC and provisions for recirculation systems should be updated to include demand-based recirculation. This method of reducing water waste is much more accurate than simply stated a “catch-all” maximum length.

Cost Impact: None

P128-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.2-P-STRAUSBAUGH.PMGCAC

P129 – 12

607.2.2 (New), 607.2.2.1(New), 607.2.2.2 (New)

Proponent: Gary Klein, Affiliated International Management, LLC, representing self

Add new text as follows:

607.2.2 Hot or tempered water recirculation systems. Hot or tempered water recirculation systems shall be provided with a recirculation pump. Gravity and thermo-syphon circulation systems shall be prohibited. Recirculation system pump controls shall comply with Sections 607.2.2.1 and 607.2.2.

607.2.2.1 Recirculating pump controls. Recirculating pump controls that allow timer-activated, water temperature-activated or continuous operation of the pump shall be prohibited. Recirculating pumps shall be demand activated by one of the following means:

1. A switch operated by the user of the fixture.
2. A motion sensor triggered by the presence of the user of the fixture.
3. A flow switch activated by the flow of hot water at a fixture.
4. A door switch activated by the door to the room containing hot water-supplied fixtures.
5. A voice activated command.

After the pump starts, the controls shall allow the pump to operate until the water temperature in the return pipe rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe. The controls shall not allow the pump to operate when the temperature in the pipe exceeds 102ºF (38.9 ºC). Controls shall limit pump operation to not more than 5 minutes for each activation in the event that both means of shutting off the pump have failed.

607.2.2.2 Control manufacturer instructions . The manufacturer of the controls for the recirculation pump shall provide installation and operation instructions that provide details of the operation of the controls. Such instructions shall be available at the jobsite for inspection by the code official.

(Renumber subsequent section)

Reason:

1. This proposal was approved on consent at the 2012 IgCC Final Action Hearing in Phoenix. The wording in this proposal has the same content and has been modified for better correlation with the IPC. The description of the allowable pump control – on demand – has been drawn from the definition of Demand Recirculation Water System in the 2012 IECC.
2. Circulation systems with demand controlled pumps are significantly more energy efficient than any other type of hot water circulation system. The table below shows the relative energy consumption for all types of circulating systems covered in this section. The annual energy needed to keep the loop hot with water heated electrically or with natural gas are shown separately from the energy needed for the pump. The majority of the energy is lost in keeping the water in the loop at the desired temperature (all of it if there is a gravity loop). Two lengths of circulation loop are analyzed: 100 feet and 200 feet. The costs and savings remain proportional as the length of the circulation loop and the flow rate of the pump increase. Savings from demand controlled pumping systems have been documented by the Southern California Gas Company, which is now running an energy efficiency program that supports their installation.
3. The IPC requires that the hot water piping in automatic temperature maintenance systems be insulated with at least 1 inch of pipe insulation. The water in the circulation loop will stay hot for a very long time – 45 minutes for ¾ inch nominal pipe up to 2 hours for 2-inch nominal pipe – if the circulating pump is shut off.
4. If this is the case, why run the pump? Why run the pump when no one is in the building or when no one is demanding hot water? The only time it makes sense to run the pump is shortly before hot water is needed: hence the requirement that the pump be controlled on-demand by one of the mechanisms in the section.

Annual Energy Required for Operating Circulation Systems

		Recirculation						Demand Controlled Priming	
		Daily Hours of Operation							
		24	12	8	6	4	2		
1	**Small Hot Water System: Trunk, Branch, and Twig**								
	Loop Heat Losses							**Loop Heat Losses**	
	Natural Gas (therms)	292	146	97	73	49	24	Natural Gas (therms)	3
	Electric (kWh)	6,388	3,194	2,129	1,597	1,065	532	Electric (kWh)	67
	Pump Energy(kWh)	438	219	146	110	73	37	**Pump Energy(kWh)**	8
2	**Medium Hot Water System: Trunk, Branch, and Twig**								
	Loop Heat Losses							**Loop Heat Losses**	
	Natural Gas (therms)	584	292	195	146	97	49	Natural Gas (therms)	6
	Electric (kWh)	12,775	6,388	4,258	3,194	2,129	1,065	Electric (kWh)	133
	Pump Energy(kWh)	438	219	146	110	73	37	**Pump Energy(kWh)**	16

Thank you for considering this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

P_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

P129-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.2.2 (NEW)-P-KLEIN

P130 – 12

607.2.3 (New), 607.2.3.1 (New), 607.2.3.2 (New), 607.2.3.2.1 (New), 607.2..3.2.2 (New), Table 607.2.3.1 (New)

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Janine Snyder, Colorado Code Consulting, LLC representing self (janinesnyder@yahoo.com)

Add new text as follows:

607.2.3 Efficient hot and tempered water supply piping. Hot and tempered water supply piping shall comply with either the maximum allowable pipe length or maximum allowable pipe volume methods in this section.

607.2.3.1 Maximum allowable pipe length method. The maximum allowable pipe length from the source of hot or tempered water to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length columns in Table 607.2.3.1. Where the length contains more than one size of pipe, the largest size pipe shall be used for determining the maximum allowable length of the pipe in Table 607.2.3.1.

607.2.3.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section 607.2.3.3. The maximum volume of hot or tempered water in the piping to public lavatory faucets, metering or non-metering, shall be 2 ounces (0.06 L). For other fixtures the maximum volume shall be 64 ounces (1.89 L) for hot or tempered water from a water heater or boiler; and 24 ounces (0.7 L) for hot or tempered water from recirculating system or heat-traced piping.

607.2.3.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the source of hot water and the termination of the fixture supply pipe. The volume shall be determined from the liquid ounces per foot column of Table 607.2.3.1. The volume contained within fixture shut off valves, flexible water supply connectors to a fixture fitting or within a fixture fitting shall not be included in the water volume determination. Where hot or tempered water is supplied by recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the source pipe that supplies water to the fixture.

607.2.3.3 Maximum flow rate. The flow rate of fixtures shall be limited to 0.5 gpm where connected to 1/4 inch piping; to 1 gpm where connected to 5/16 inch piping; and to 1.5 gpm where connected to 3/8 inch piping.

TABLE 607.2.3.1
MAXIMUM LENGTH OF PIPE

NOMINAL PIPE SIZE (INCH)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE LENGTH		
		SYSTEM WITHOUT A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	SYSTEM WITH A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	LAVATORY FAUCETS—PUBLIC (METERING AND NON-METERING) (FEET)
1/4	0.33	50	16	6
5/16	0.5	50	16	4
3/8	0.75	50	16	3
1/2	1.5	43	16	2
5/8	2	32	12	1
3/4	3	21	8	0.5

NOMINAL PIPE SIZE (INCH)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE LENGTH		
		SYSTEM WITHOUT A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	SYSTEM WITH A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	LAVATORY FAUCETS—PUBLIC (METERING AND NON-METERING) (FEET)
7/8	4	16	6	0.5
1	5	13	5	0.5
1 ¼	8	8	3	0.5
1 ½	11	6	2	0.5
2 or larger	18	4	1	0.5

Reason:

1. The 2012 IPC reduced the allowable distance from the source of hot or tempered water to the fixtures from100 to 50 feet. This was an excellent change. However, limiting the length did not get at the real issue, which is the volume from the source to the use, Limiting volume has the effect of limiting pressure losses due to length, reducing the time it takes for hot water to arrive (time-to-tap) and reducing the amount of water wasted while waiting for the hot water (volume-to-hot). Limiting the volume in the hot water supply system piping also has the effect of reducing the energy losses during use and when the water in the pipes eventually cools down.
2. This proposal builds on the 2012 IPC by limiting the volume, while staying within the 50 foot developed length restriction, which is the intent of the proponents.
   a. It is possible for a single pipe to be installed 50 feet long with no fittings in between the source and the fixture; in that case the developed length is the same as the actual length.
   b. When fittings and valves are needed, which is likely, the actual length may need to be reduced to accommodate the extra pressure drop. This is most likely to be necessary for nominal ¼, 5/16 and 3/8 inch pipe in hot water supplies without recirculation system or heat-traced piping, however, it may also be necessary for other diameters too if the fittings and valves create significant restrictions to flow.
3. The core of this proposal was approved at the 2012 IGCC Final Action Hearing in Phoenix. The wording has been revised so that it fits within context of Section 607.2 of the IPC. The footnote has been removed so that the language could be more appropriately worded as a requirement.
   a. The proposal that was approved at the IGCC FAH was revised from the original wording in IGCC Public Version 2. Improvements include clarifying the distinctions between two types of hot water supply systems; those with a recirculation system or heat traced trunk line and those without and providing for a means of compliance without it being necessary to calculate the volume for most applications. This makes it easier for everyone involved.
   b. The table in PV 2 contained ounces per foot of different types of hot or tempered water piping. Based on recommendations from several code officials around the country, the table was revised to
      I Simplify the calculations, when necessary, by averaging the volumes for the different types of piping for each nominal pipe diameter and then rounding off to a simple to use and easy to remember number. The volumes that were averaged were taken from the table in PV 2 and are also contained in Table E 202.1 of the IPC. The revised table is now applicable to all piping materials approved now or in the future for use with hot or tempered water.
      II Include 1/4, 5/16, 5/8 and 7/8 inch nominal diameters. Piping materials are available in these diameters, although they are not widely used. Including them in this table provides values that will enable their use.
      III Limit the maximum fixture flow rate when 1/4, 5/16 and 3/8 inch diameter piping is being used (Section 607.2.3.3). The flow rates in the footnote were selected, using the Hazen-Williams formulas, to keep the velocity below 5 feet per second, which minimizes pressure drop, reduces noise and limits the rate of any internal corrosion. The same formulas were used to limit the pressure drop at these flow rates to no more than 5 psi in the 50 foot lengths of 1/4, 5/16 and 3/8 inch diameter piping; the pressure drop will be much less in the shorter lengths in the other columns.
      IV Limit the length of the small diameter tubing (1/4 – 1/2 inch inclusive) at 50 feet in hot water supply piping without recirculation systems or heat-traced lines. This correlates with the changes adopted in the 2012 IPC. Another reason for not using the 64-ounce volume allowance in small tubing is that otherwise the maximum length of 5/16 inch tubing could be 128 feet and 1/4 inch tubing could be 192 feet! Pressure loss at these lengths would be excessive and unacceptable, as would heat loss. In addition, limiting length to 50 feet reduces the time-to-tap and the amount of water wasted while waiting for hot water to arrive, thereby improving performance for the user as well as water and energy waste.
      V Limit the length of the small diameter tubing (1/4 – 1/2 inch inclusive) at 16 feet in hot water supply piping with recirculation systems or heat-traced lines. The purpose of the circulation loop or heat-traced line is to bring the source of hot water close (in volume) to the fixtures, thereby reducing the time-to-tap and the waste of water and energy. Given typical floor-to-ceiling heights in the occupancies covered by this code, it is possible to reach the angle stop of a lavatory or a tub-shower valve with 16 feet of pipe coming down the wall from a recirculation system in the ceiling. Additionally, limiting the length of the smaller diameter tubing will improve the time-to-tap for the lower flow rate fixtures the tubing is intended to serve.
      VI Limit the length serving lavatory faucets – public (metering and non-metering) in all hot water supply systems. These are the faucets where we wait a very long time for hot water to arrive – or we give up! Lavatory faucets are generally used for very short periods of time and hot water needs to arrive very quickly for it to be useful. Since the flow rates

are so low, it is critical that there be very little volume between the source of hot water and these faucets. I know that 2 ounces, and the corresponding feet are very small, but if we do this, hot water will arrive in less than 5 seconds after we turn on the faucet. And, there are several cost effective, energy efficient ways to meet this requirement.

VII It is the intent of the proponents that either the maximum allowable volume or maximum allowable length method be allowed in any occupancy.

VII It is also the intent of the proponents that the contents of this section apply to all occupancies.

4. Adopting this proposal will improve the performance of hot water distribution systems by:
   a. Helping to ensure that the pressure drop from the source of hot water to the fixtures is not excessive.
   b. Reducing the time it takes to get hot water after opening a tap. This is particularly important for lavatory faucets-public, which, in accordance with Federal law that has been in effect since the mid-1990s, are required to have flow rates no larger than 0.5 gallons per minute (non-metering) or 0.25 gallons per cycle (metering).
   c. Reducing the waste of water while waiting for hot water to arrive.
   d. Reducing the energy losses during delivery, use and cool down phases of all hot water events.
5. We urge your support for this proposal. Thank you.

Cost Impact: The code change proposal will not increase the cost of construction.

The 2012 IPC limits the distance from the source of hot water to the use to no more than 50 feet of developed length. There is no limit on the volume in this length of pipe. (By way of reference, the 2009 IPC had a limit of 100 feet and no limit on the volume, so the 2012 IPC is an improvement over 2009.)

This code change minimizes the volume in the piping between the source of hot water and the uses. It has the effect of eliminating long, large volume pipe runs resulting in sizable material and labor savings.

In most cases, reducing the volume between the sources of hot water and the fixtures will reduce costs. There are generally many more branches, and particularly fixture branches, than there are trunk lines, recirculation system or heat-traced piping in a building. Getting the source closer to the use reduces the number of feet in each of these branches and it will also reduce the diameter: both of these reduce costs of the hot water supply piping as well as any insulation that is required. In some cases it will be necessary to increase the length of the trunk or recirculation system piping to get closer to the fixtures. In others the architect and engineers will decide to locate the hot water uses more centrally: this will reduce the costs of the hot water, the cold water, the drain lines and any required insulation too!

There are two primary cases to be considered: (1) when the source of hot water is a water heater or boiler and (2) when the source of hot water is recirculation system or heat-traced piping.

Assuming that there is a bathroom group at the end of the 50 feet of length, it would be very common to see a 1-inch pipe, either from a water heater or from a circulation loop in any occupancy. This pipe contains approximately 2 gallons. In order for hot water to get to the bathroom group a minimum of 2 gallons will run down the drain before the hot water arrives. In practice, we observe 3-4 gallons will run down the drain. (If the pipe were 3/4-inch nominal, the volume would be closer to 1.25 gallons and the typical waste would range from 1.25 to 2.5 gallons. However, if someone decided to use a 1.5-inch branch line to the bathroom group, the volume in the pipe would be more than 4.25 gallons and the waste would range from 4.25 to more than 8 gallons.)

Based on the above example, it is reasonable to assume that the amount of water currently wasted while waiting for hot water to arrive ranges from 1 gallon (128 ounces) to more than 4 gallons (512 ounces), the savings from a water heater will range from 50% ((128-64)/128) for a branch from a water heater to the use to 95% ((512-24)/512) for a branch from recirculation system or heat-traced piping to the use.

In addition to lower first costs, there are significant savings in water, energy and time. All of this water came through the water heater, so there is energy attached to it. There is also energy lost as the hot water moves from the source to the use, even if it is insulated. If the hot water is on an upper story, there is energy expended in lifting it to that floor. In addition, there is energy embedded in the cold water that came to the building and to the water that is taken away for wastewater treatment.

P130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.2.3 (NEW)-P-KLEIN-SNYDER

P131 – 12
607.3, 607.3.1, 607.3.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

607.3 Thermal expansion control. ~~A means of controlling increased pressure caused by thermal expansion shall be provided where required in accordance with Sections 607.3.1 and 607.3.2.~~ Where a storage water heater is supplied with cold water that passes through a check valve, pressure reducing valve or backflow preventer, a thermal expansion tank shall be connected to the water heater cold water supply pipe at a point that is downstream of all check valves, pressure reducing valves and backflow preventers. Thermal expansion tanks shall be sized in accordance with the tank manufacturer's instructions and shall be sized such that the pressure in the water distribution system shall not exceed that required by Section 604.8.

~~**607.3.1 Pressure-reducing valve.** For water service system sizes up to and including 2 inches (51 mm), a device for controlling pressure shall be installed where, because of thermal expansion, the pressure on the downstream side of a pressure-reducing valve exceeds the pressure-reducing valve setting.~~

~~**607.3.2 Backflow prevention device or check valve.** Where a backflow prevention device, check valve or other device is installed on a water supply system utilizing storage water heating equipment such that thermal expansion causes an increase in pressure, a device for controlling pressure shall be installed.~~

Reason: Any time there is a pressure reducing device, a check valve or a backflow preventer in the cold water piping to a storage-type water heater, a means to compensate for thermal expansion must be installed. This is typically accomplished with an expansion tank. Other methods for relieving thermal expansion pressure, such additional relief valves, waste water for the life of the system. Thermal expansion tanks are required by most storage water heater manufacturers to protect the water heater. Expansion tank manufacturers typically size their tanks so that the water distribution system pressure will remain just shy of the pressure required to open a 150 psi water heater relief valve. This will allow the system pressure to exceed the maximum pressure intended by Section 604.8, which is unacceptable.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P131-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.3-P-STRAUSBAUGH.PMGCAC

P132 – 12
Table 608.1, 608.13.6, Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes $^{1}/_{2}$″–1″	ASME A112.21.3, ASSE 1052, CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes 1/2″,3/4″, 1″	ASME A112.21.3, ASSE 1011, CSA B64.2, CSA B64.2.1
Vacuum breaker wall hydrants, frost-resistant, automatic draining type	High or low hazard	Low head backpressure or backsiphonage Sizes 3/4″, 1″	ASME A112.21.3, ASSE 1019, CSA B64.2.2

(Portions of table not shown remain unchanged)

608.13.6 Atmospheric-type vacuum breakers. Pipe-applied atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASME A112.21.3, ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height.

Add new standard to Chapter 14 as follows:

ASME
A112.21.3–1985(R2007) Hydrants for Utility and Maintenance Use

Reason: There also other hydrants and hose connections with the proper backflow preventer or vacuum breaker that exist other than those complying with the ASSE and CSA standards. These hydrants are for utility and maintenance use. This is a National standard (ANSI) which covers the performance requirements for these types of devices.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.21.3-1985(R2007) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P132-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T608.1-P-CONSTANTINO

P133 – 12
Table 608.1

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
BACKFLOW PREVENTION ASSEMBLIES:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes 3/8" - 16"	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 3/8" - 16"	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2" - 2"	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes 3/8 " – 16 "	ASSE 1013, AWWA C511, CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backpressure or backsiphonage (Fire Sprinkler Systems)	ASSE 1047
Spill-resistant vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2" - 2"	ASSE 1056
BACKFLOW PREVENTER PLUMBING DEVICES:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002, CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes 1/4" – 3/8"	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes 1/4" – 3/8"	ASSE 1012, CSA B64.3
Dual check valve type backflow preventers	Low hazard	Backpressure or backsiphonage Sizes 1/4"-1"	ASSE 1024, CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes1/2"- 1"	ASSE 1052, CSA B64.2, B64.2.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage only	ASSE 1011, CAN/CSA B64.1.1

		Sizes 1/2", 3/4 ", 1"	
Laboratory Faucet Backflow Preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035, CSA B64.7
Atmospheric type vacuum breaker	High or low hazard	Backsiphonage only Sizes 1/2" - 4"	ASSE 1001, CSA B64.1.1
Vacuum breaker wall hydrants, frost resistant, automatic draining type	High or low hazard	Low head backpressure and backsiphonage Sizes 3/4 ", 1"	ASSE 1019, CSA B64.2.2
OTHER MEANS or METHODS:			
Air gap	High or low hazard	Backsiphonage only	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backpressure or backsiphonage	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.13.4)

For SI: 1 inch = 25.4 mm

a. Low Hazard - See Pollution (Section 202), High Hazard - See Contamination (Section 202)

b. See Backpressure (Section 202), See Backpressure, low head (Section 202), See Backsiphonage (Section 202)

Reason: There is much confusion concerning protection provided by any 'backflow preventer'. Reorganizing this table would better identify proper and correct applications for code users by identifying the different protection methods: assemblies, backflow prevention devices and other means or methods. The existing table gives the mistaken understanding that "any of the above provides adequate protection for any job". This is not true. Adequate protection is based on hazard classification, application and proper installation. Backflow prevention assemblies are specifically recognized and accepted as separate and distinct units based on Section 312.10.2 because of their requirement for periodic testing to ensure proper and reliable operation in order to protect public health.

Cost Impact: The code change proposal will not increase the cost of construction.

P133-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T608.1-P-MOSS

P134 – 12
608.6

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

608.6 Cross-connection control. Cross-connections shall be prohibited, except where approved <u>backflow prevention assemblies, backflow prevention devices or other means or</u> methods are installed to protect the potable water supply.

Reason: "Methods" are not defined in the definitions. The term from Chapter 2 is **"**Backflow Preventer**.** The definition of methods would be complete and precise with a change to: "BACKFLOW PREVENTER**.** A backflow prevention assembly, a backflow prevention device or other means or method to prevent backflow into the potable water supply."

Cost Impact: The code change proposal will not increase the cost of construction.

P134-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.6-P-MOSS

P135 – 12
608.8, 608.8.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

608.8 Identification of nonpotable water systems. Where *nonpotable* water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking or metal tags in accordance with Sections 608.8.1 through 608.8.~~3~~2.

608.8.1 Signage Required. All nonpotable water outlets such as hose connections, open ended pipes, and faucets shall be identified ~~at the point of use for each outlet with the words, "Nonpotable-not safe for drinking~~ ." with signage that reads as follows: "Non-potable water is utilized for [application name]. Caution: non-potable water. DO NOT DRINK."The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and in colors in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 608.8.1 shall appear on the signage required by this section.

608.8.~~1~~2 ~~Information~~. Distribution Pipe Labeling and Marking. Non-potable distribution piping shall be of the color purple and shall be embossed or integrally stamped or marked with the words: "CAUTION: NONPOTABLE WATER – DO NOT DRINK" or shall be installed with a purple identification tape or wrap. Pipe identification shall include the contents of the piping system and an arrow indicating the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at intervals not exceeding 25 feet (7620 mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable within the room or space where the piping is located.

608.8.2.1 Color. The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify reclaimed, rain and gray water distribution systems.

608.8.2.2 Lettering Size. The size of the background color field and lettering shall comply with Table 608.8.2.2.

608.8.2.3 Identification Tape. Where used, identification tape shall be at least 3 inches wide and have white or black lettering on purple field stating "CAUTION: NON-POTABLE WATER – DO NOT DRINK". Identification tape shall be installed on top of non-potable rainwater distribution pipes, fastened at least every 10 feet to each pipe length and run continuously the entire length of the pipe.

Table 608.8.2.2

SIZE OF PIPE IDENTIFICATION

PIPE DIAMETER (inches)	LENGTH BACKGROUND COLOR FIELD (inches)	SIZE OF LETTERS (inches)
$^3/_4$ to $1^1/_4$	8	0.5
$1^1/_2$ to 2	8	0.75
$2^1/_2$ to 6	12	1.25
8 to 10	24	2.5
over 10	32	3.5

For SI 1 inch = 25.4 mm.

Figure 706.2 Pictograph – DO NOT DRINK

Figure 608.1.1 Pictograph – DO NOT DRINK

Reason: Water distribution systems of other than potable water are being installed in buildings and the code needs to require marking of the piping and signage for the outlets for safety reasons. The basis for this new language is text from the IgCC and is written to be in alignment with the IgCC requirements.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P135-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.8-P-STRAUSBAUGH.PMGCAC

P136 – 12
202, 608.8.2

Proponent: Alan Rimer, Black and Veatch, representing the American Water Works Association's Water Reuse Committee

Add new definition as follows:

<u>**RECLAIMED WATER DISTRIBUTION SYSTEM.** Piping and appurtenances that are of the color purple and that are intended to convey only reclaimed water.</u>

Revise as follows:

608.8.2 Color. The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify *reclaimed*~~, rain and gray~~ *water distribution systems*. <u>The color gray with purple striping shall be used to identify rain and gray water distribution systems.</u>

Reason: Current municipal utilities throughout the world have adopted purple as the color used for any pipe conveying reclaimed water. It is an ASTM approved standard and does not permit the conveyance of other waters (such as rainwater or grey water) in purple pipe.

Cost Impact: The code change proposal will not increase the cost of construction.

P136-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.8.2-P-RIMER

AS SUBMITTED:

P________ – 12
202, 608.8.2

Proponent: Alan Rimer, Black and Veatch, representing the American Water Works Association's Water Reuse Committee

Add new definition as follows:

RECLAIMED WATER DISTRIBUTION SYSTEM. A reclaimed water distribution system shall consist of piping and appurtenances that are of the color purple and are intended to convey only reclaimed water.

Revise as follows:

608.8.2 Color. The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify *reclaimed*~~, rain and gray~~ *water distribution systems*. The color gray with purple striping shall be used to identify rain and gray water distribution systems.

Reason: Current municipal utilities throughout the world have adopted purple as the color used for any pipe conveying reclaimed water. It is an ASTM approved standard and does not permit the ????

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.8.2-RIMER

P137 – 12
608.11

Proponent: Jeremy Brown, NSF International (brown@nsf.org)

Revise as follows:

608.11 ~~Painting of~~ Potable water tanks. Potable water tanks, interior coatings for potable water tanks and liners for potable water tanks shall conform to NSF 61. The interior surface of a potable water tank shall not be lined, painted or repaired with any material that changes the taste, odor, color or potability of the water supply when the tank is placed in, or returned to service.

Reason: NSF/ANSI Standard 61 Drinking Water System Components-Health Effects addresses crucial aspects of drinking water system components: whether contaminants that leach or migrate from the product/material into the drinking water are above acceptable levels in finished waters. Requiring NSF 61 will help protect the drinking water supply from the leaching of contaminants. The IPC and IRC already requires conformance to NSF 61 for pipes, fittings, faucets and valves intended to supply drinking water. (Sections 424.1, 605.3, 605.4, 605.5, 605.7 of IPC). It is logical that tanks should have to meet this same requirement to protect the drinking water. This requirement is also referenced in the Uniform Plumbing Code, and the water works regulations of 46 states.

There are adequate products on the market to fulfill this requirement as there are hundreds of products listed by NSF and other third party certifiers.

Cost Impact: This will not increase the cost of construction.

P137-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.11-P-BROWN

P138 – 12
608.13.3

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

608.13.3 Backflow preventer with an intermediate atmospheric vent. Backflow preventers with an intermediate atmospheric vent~~s~~ shall conform to ASSE 1012 or CSA B64.3. These backflow prevention devices shall be permitted to be installed where subject to continuous pressure conditions downstream of the device. Such devices shall only be installed in systems serving a single dwelling unit. The installation of these devices shall be prohibited where chemicals are introduced into the system downstream of the device. The relief opening shall discharge by air gap and shall be prevented from being submerged.

Reason: These backflow preventers are designed and sold for non-health hazard installations according to manufacturer specification sheets. They are inadequate for chemical additions or injections. Their use should be limited to potable water systems within a residential system only. Reference in Section 608.15.3 and Section 608.16.2.

Cost Impact: The code change proposal will not increase the cost of construction.

P138-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.13.3-P-MOSS

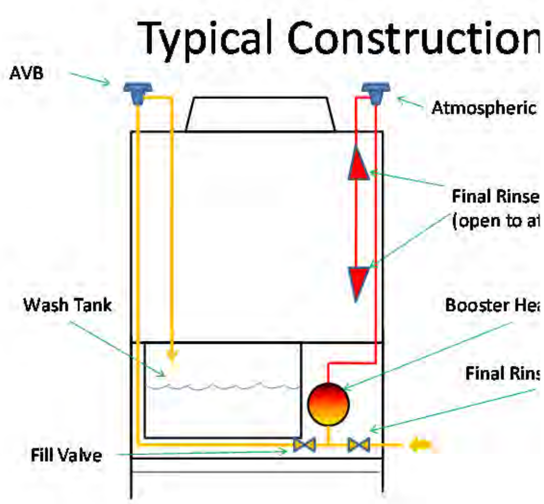
P139 – 12
608.13.6

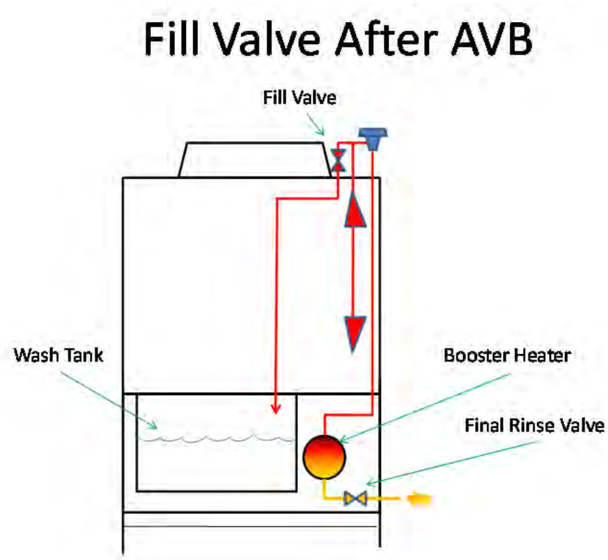
Proponent: Joel F. Hipp, Hobart Corporation representing Hobart Corporation (joel.hipp@hobartcorp.com)

Revise as follows:

608.13.6 Atmospheric-type vacuum breakers. Pipe applied atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height. <u>The outlet of a pipe applied atmospheric vacuum breaker shall not have a valve downstream except where there are multiple outlets where not less than one outlet is continuously open to atmosphere.</u>

Reason: Commentary for paragraph 608.13.6 of the 2006 IPC states, "The outlet of atmospheric vacuum breakers must remain open to the atmosphere by terminating with a pipe, spout or similar unobstructed opening. Valves must not be installed downstream of this device because this would subject the device to supply pressure, thereby rendering it inoperative." However, when designed properly, a valve can be located downstream from the AVB. The following figures illustrate this on a commercial dishwasher application.





Even though the fill valve is downstream from the atmospheric vacuum breaker, the "TEE" between the two allows pressure to remain atmospheric at all times. Although the commentary is not a substitute for the code, it is often interpreted and enforced as code language. For this reason we urge the committee to add the wording as proposed.

Cost Impact: The code change proposal will not increase the cost of construction.

P139-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.13.6-P-HIPP

P140 – 12
608.13.6

Proponent: Michael Moss, American Backflow Prevention Association **(**msmoss@utah.gov)

Revise as follows:

608.13.6 Atmospheric-type vacuum breakers. ~~Pipe applied~~ Atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. The outlet of a ~~These devices~~ vacuum breaker shall be open to the atmosphere.~~operate under normal atmospheric pressure when the critical level is installed at the required height.~~ The atmospheric vacuum breaker shall be installed with it's critical level marking not less than 6 inches (152 mm) above the highest elevation of the downstream piping or the flood level rim of the fixture or device.

Reason: Installation of vacuum breakers needs to be compliant with published manufacturer installation instructions. The information is the minimum standard for industry. This installation criteria provides adequate protection of the water supply and ensures protection of public health.

Cost Impact: The code change proposal will not increase the cost of construction.

P140-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.13.6-P-MOSS

P141 – 12
608.13.7

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

608.13.7 Double check~~-valve~~ backflow prevention assemblies. Double check~~-valve~~ backflow prevention assemblies shall conform to ASSE 1015, CSA B64.5, CSA B64.5.1 or AWWA C510. Double-~~detector~~ check~~-valve~~ detector fire protection backflow prevention assemblies shall conform to ASSE 1048. These ~~devices~~ assemblies shall be capable of operating under continuous pressure conditions.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

P141-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.13.7-P-MOSS

P142 – 12
608.13.10 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

608.13.10 Dual check valve backflow preventer. Dual check valve backflow preventers shall conform to ASSE 1024 or CSA B64.6.

Reason: Table 608.1 lists ASSE 1024, CSA B64.6 (dual check valves) but currently there is no code text associated with these devices. This new section is added to correct this problem.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P142-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.13.10 (NEW)-P-STRAUSBAUGH.PMGCAC

P143 – 12
608.15.4

Proponent: Michael Moss, American Backflow Prevention Association representing himself (msmoss@utah.gov)

Revise as follows:

608.15.4 Protection by a vacuum breaker. Openings and outlets shall be protected by atmospheric-type or pressure~~-type~~ vacuum breaker~~s~~ assemblies. ~~The critical level of the vacuum breaker shall be set a minimum of 6 inches (152 mm) above the flood level rim of the fixture or device.~~ Vacuum breakers shall not be installed under exhaust hoods or similar locations that will contain toxic fumes or vapors. Atmospheric type ~~Pipe-applied~~ vacuum breakers shall be installed with their critical level at a point not less than 6 inches (152 mm) above the highest elevation of downstream piping and the flood level rim of ~~the~~ any fixture, receptor or device served. Fill valves shall be ~~set~~ installed in accordance with Section 425.3.1. Pressure vacuum breaker and spill resistant vacuum breaker assemblies shall be installed with their critical level at a point not less than 12 inches (304 mm) above the highest elevation of downstream piping and the flood level rim of any fixture, receptor or device served.

Reason: Installation of different types of vacuum breakers within this section conflicts with published manufacturer installation instructions. Manufacturer literature recommends 12 inch installation above downstream piping and outlets for PVB's and SVB's for most conditions. This provides adequate protection of the water supply and ensures protection of public health.

Cost Impact: The code change proposal will not increase the cost of construction.

P143-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.15.4-P-MOSS

P144 – 12
608.15.4.2

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

608.15.4.2 Hose connections. Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric-type <u>vacuum breaker</u> or <u>a</u> pressure-type vacuum breaker <u>assembly</u> or a permanently attached hose connection vacuum breaker.

Exceptions:

1. This section shall not apply to water heater and boiler drain valves that are provided with hose connection threads and that are intended only for tank or vessel draining.
2. This section shall not apply to water supply valves intended for connection of clothes washing machines where backflow prevention is otherwise provided or is integral with the machine.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

P144-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.15.4.2-P-MOSS

P145 – 12
608.15.4.3 (New)

Proponent: Bob Scott, Kye Lehr and Robert Gallegos, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Add new text as follows:

<u>**608.15.4.3 Urinal Flushometers.** Integral vacuum breakers for urinal flushometers shall be located with the critical level located not less than 6 inches (152 mm) above the highest portion of the fixture.</u>

Reason: This added verbiage will remove confusion on installation of flushometers on urinals where the critical level must be a located at least 6 inches above the top of the fixture.

Cost Impact: None.

P145-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.15.4.3 (NEW)-P-SCOTT-LEHR-GALLEGOS

P146 – 12
608.16.2

Proponent: Michael Moss, American Backflow Prevention Association (msmoss@utah.gov)

Revise as follows:

608.16.2 Connections to boilers. ~~The potable supply to the boiler shall be equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012 or CSA B64.3. Where conditioning chemicals are introduced into the system,~~ The potable water connection <u>to a boiler</u> shall be protected by an *air gap* or a reduced pressure principle backflow preventer complying with ASSE 1013, CSA B64.4 or AWWA C511.

Reason: These assemblies are designed and sold for high-health hazard installations according to manufacturer specification sheets. They are adequate for chemical additions or injections. Reference in Section 608.15.3 and Section 608.16.2.

Cost Impact: The code change proposal will not increase the cost of construction.

P146-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

608.16.2-P-MOSS

P147 – 12
610.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

610.1 General. New ~~or repaired~~ potable water systems shall be purged of deleterious matter and disinfected prior to utilization. The method to be followed shall be that prescribed by the health authority or water purveyor having jurisdiction or, in the absence of a prescribed method, the procedure described in either AWWA C651 or AWWA C652, or as described in this section. This requirement shall apply to "on-site" or "in-plant" fabrication of a system or to a modular portion of a system.

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing not less than 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing not less than 200 parts per million (200 mg/L) of chlorine and allowed to stand for 3 hours.
3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.

Reason: The current language seems to suggest that anytime a general repair is made to a potable water system that the entire system must then be disinfected. For example, one riser valve in a 35 story high rise is repaired or replaced. Is it the intent of the code to then require the entire potable water system to be disinfected? Repairs should not trigger the need for disinfection of an entire water system.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P147-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

610.1-P-STRAUSBAUGH.PMGCAC

P148– 12
613.1, 613.2 (New), 613.3 (New)

Proponent: Ron George, CPD, Plumb-Tech Design & Consulting Services LLC, representing himself (Ron@Plumb-TechLLC.com)

Revise as follows:

613.1 Master water temperature-actuated mixing valves. ~~Temperature actuated mixing valves, which are installed to reduce water temperatures to defined limits, shall comply with ASSE1017.~~ Where a master water temperature-actuated mixing valve is installed to control the hot water temperature to specified limits, it shall be located at the water heater. The piping from the hot water outlet of the water heater to the mixing valve shall be have a mechanical heat trap installed or the piping shall be configured in a heat trap piping arrangement that drops not less than 24 inches (610mm) before rising to connect to the mixing valve. A shut off valve shall be installed in the piping before each inlet and after the outlet of the mixing valve. A water temperature indicating device shall be installed in the outlet piping and shall be located within six feet (1829 mm) of the outlet of the mixing valve. The mixing valve shall be sized for the maximum and minimum anticipated flows in accordance with the manufacturer's sizing instructions or generally accepted engineering guidelines. Master water temperature-actuated mixing valves shall comply with ASSE 1017 and shall be installed in accordance with the manufacturer's instructions.

613.2 Point-of-use water temperature-actuated mixing valves. Point-of-use water temperature-actuated mixing valves installed for the purpose of limiting the water temperature at a sink, lavatory or group of lavatories shall comply with ASSE 1070 or CSA B125.3. A shutoff valve shall be installed in the piping to each inlet of the mixing valve. The mixing valve shall be sized in accordance with the manufacturer's sizing instructions for the maximum and minimum anticipated flows. Point-of use water temperature mixing valves shall be installed in accordance with the manufacturer's instructions.

613.3 Temperature-actuated mixing valves for gang showers. Temperature-actuated mixing valves installed for the purpose of limiting the water temperature to gang showers shall comply with Section 424.4. A shut off valve shall be installed in the piping before each inlet and after the outlet of the mixing valve. A water temperature measuring device shall be installed in the piping at the shower valve that is nearest to the mixing valve. The temperature indicator for the water temperature measuring device shall shall be located within six feet (1829 mm) of the mixing valve. The mixing valve shall be sized and installed in accordance with the manufacturer's sizing and installation instructions for the maximum and minimum anticipated flows or generally accepted engineering practices.

Reason: Language was needed addressing the installation of thermostatic mixing valves in domestic hot water systems. For master mixing valves a temperature gauge is needed to see what the valve is mixing to. For local mixing valves no temperature gauge is needed because water temperatures can be tested at a nearby fixture. Gang showers need a temperature gauge at the valve, because it is often remote from the showers in school, prison or jail applications.

Cost Impact: The code change proposal will not increase the cost of construction. These mixing valve devices are not mandatory so there is no increase in cost. This code language gives guidance by listing the appropriate industry standards to comply with only when these devices are installed.

P148-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

613.1-P-GEORGE

P149 – 12
614 (New)

Proponent: Tom Allen, City of Mt. Dora, FL representing self

Add text as follows:

SECTION 614
WELL PUMPS AND TANKS USED FOR PRIVATE POTABLE WATER SYSTEMS

614.1 Pumps. Well pumps used for potable water shall comply with Sections 614.1.1 and 614.1.2

614.1.1 Pump installation. Pumps shall be installed for operation without repriming or breaking suction. Pumps shall be connected to the well head by means of a union, companion flange or compression coupling in such a manner that it is accessible for maintenance, repair and removal.

614.1.2 Pump sizing. The minimum pump well pump size shall be determined in accordance with Table 614.1.2

TABLE 614.1.2
MINIMUM PRIVATE POTABLE WATER SYSTEM PUMP SIZE

	NUMBER OF BATHROOMS IN BUILDING[b]				
	1	1 to 1 ½	2 to 2 ½	3 to 4	5 to 6
MINIMUM PUMP SIZE[a]	7 gpm	10 gpm	14 gpm	17 gpm	21 gpm

a. Values shown are average and do not include high or low extremes.
b. Installations over 6 bathrooms shall be approved by the code official.

614.2 Pressure tanks. Pressure tanks relying on expansion of a flexible membrane within a restricting container or tanks with direct water-to-air interface to provide pressure in the water system shall be used. Pressure tanks for storing potable water under pressure, including those having an air-space for pressure for expansion, shall be identified by a seal, label or plate indicating the manufacturer's name and model number. Tanks shall comply with all of the following:

1. Pressure tank drawdown shall be not less than of 1 gallon (3.8 L) for every gallon per minute produced by the pump.

   Exception: Pump start applications, constant pressure devices and variable speed pumps.

2. Pressure tanks shall be constructed of steel, fiberglass or comparable materials. Tanks to be buried shall be designed by the manufacturer for underground use. Fiberglass or other nonmetallic tanks to be buried shall have the structural strength to prevent collapse.

614.3 Piping. Piping associated with pumps and tanks shall comply with Sections 614.3.1 through 614.3.3.

614.3.1 Drop pipe. The drop pipe from the submersible pump to the first fitting past the well seal shall be either galvanized steel, stainless steel or PVC Schedule 80 threaded/coupled or lock joint pipe. The drop pipe for a single pipe, deep well jet pump shall be either galvanized steel or stainless steel. The drop pipe for a double pipe, deep well jet pump shall be either galvanized steel on the suction side and or minimum PVC schedule 40 on the pressure side.

614.3.2 Pump discharge pipe sizing. For submersible pumps, pipe size shall be equal to the pump discharge. Piping for all other types of pumps shall be sized in accordance with the pump manufacturer's specifications.

612.3.3 Pressure tank pipe sizing. Piping size for the offset of the pressure tank shall use the piping friction loss charts for the piping material used.

614.4 Electrical wiring. Wiring shall be installed in accordance with Chapter 27 of the *International Building Code.*

614.5 Disinfection. The pump installer shall disinfect the potable well and water system in accordance with Section 610.

614.6 Valves. A pressure relief valve shall be installed on pumping systems that can produce pressures of 75 psi (517 kPa) or greater. A check valve shall be installed at the well head of submersible pumps.

Reason: Provides prescriptive requirements for wells for private potable water systems

Cost Impact: There is a cost impact.

P149-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

614-P-ALLEN

P150 – 12
202, 614 (New)

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Add new definitions as follows:

WATER METER. A device that measures the volume of water supplied from a public water main to a building or to an irrigated landscape and that is used by a public water supplier to bill for water.

WATER SUB-METER. A device, other than a *water meter*, installed on a water distribution pipe or makeup water pipe that measures the volume of water supplied to a specified space or specified equipment within a building or at the building site.

Add new text as follows:

SECTION 614
WATER SUB-METERS

614.1 General. *Water sub-meters* shall be installed on sources of water and applications of water in accordance with this section. Such *water sub-meters* shall be installed in accordance with the manufacturer's installation instructions.

614.2 Sources requiring the installation of a water sub-meter. Each source of water at the building or building site intended for beneficial use shall be separately measured with a *water sub-meter*.

> **Exception:** A *water sub-meter* shall not be required for a source of water supplied to a building or building site through a *water meter*.

614.2.1 Sump pump discharge. A *water sub-meter* shall be installed on the discharge pipe serving a *sump pump*.

614.3 Applications requiring the installation of a water sub-meter. A *water sub-meter* shall be installed on a water distribution pipe that is connect to any of the following applications:

1. Automatically controlled irrigation systems serving irrigated landscapes having a combined area exceeding 2,500 ft^2 (232 m^2).
2. Cooling tower makeup water supply and blow-down water supply.
3. Evaporative coolers designed to operate with an average flow rate of more than 0.6 gpm (2.3 Lpm).
4. Fluid coolers and chillers that do not utilize closed-loop recirculation.
5. Industrial processes with a design requirement for more than 1,000 gallons (3785 L) of water per day.
6. Makeup water supplied to closed-loop cooling systems that have a rated cooling capacity of 50 tons or more.
7. Makeup water supplied to closed-loop heating systems that have a rated heating capacity of 500,000 BTU/h (146.5 kW/hr) or more.
8. Makeup water supplied to onsite water collection systems.
9. Outdoor ornamental water features with a permanently installed water supply.
10. Pools and in-ground spas, whether indoor or outdoor.
11. Roof spray systems for the irrigation of vegetated roofs or for thermal conditioning of roofs.
12. Steam boilers that have a rating of 500,000 BTU/h (146.5 kW/hr) or more.

13. Tenant spaces with a design requirement for more than 1,000 gallons (3785 L) of water per day.

614.3.1 Point of Measurement. *Water sub-meters* shall be installed at a point in the water supply system that is downstream of any connection to any other application.

614.3.2 Multiple appliances and equipment. Multiple appliances and equipment performing a single application shall be permitted to be grouped and supplied from piping connected to a single *water sub-meter*.

614.4 Requirements for water sub-meters. The *water sub-meters* required by this section shall be capable of communicating water consumption data remotely, be capable of providing daily data with electronic data storage, and have reporting capability that can produce reports that show daily, monthly, and annual water consumption.

Reason:

1. The main reasons to measure sources and applications of water include: quantify the production of on-site sources of water; identify major sub-metered uses; quantify use to determine efficiency; and identify leaks and equipment problems. Daily reporting capability will allow for prompt remediation of equipment problems and reduced duration of water loss and property damage due to leaks and equipment failure.
2. Water utilities estimate unmetered water consumption is reduced 15 to 30 percent when metering is implemented.
3. According to USEPA's WaterSense, as much as 50 percent of commercial and residential irrigation water use goes to waste due to evaporation, wind, improper system design, or overwatering. Without metering outdoor uses, that use and potential waste cannot be identified.
4. This will also bring this part of the plumbing code into alignment with ASHRAE 189.1, reducing confusion.
5. This proposal is substantially similar to language approved for the IGCC in November, 2011 (submitted by Bill Hoffman); additional language is provided here for additional clarity and to further align with the IPC.

Cost Impact: The cost impact would be minor and would depend on the type of meters for each use. Meters that meet American Water Works Association (AWWA) standards and state regulatory requirements cost between $40 (residential size) to $2,000+ (industrial size). The estimated cost to install a sub-meter in new construction is $175. The National Multiple Family Sub-metering and Allocation Study cites $150 per meter. Additionally, according to Northland Investment Corp, water sub-meters can be installed for $125 to $175 per meter (see http://www.allbusiness.com/real-estate-rental-leasing/real-activities-related-to-real/680669-1.html) and as per the City of San Diego, it costs $150 - $300 per unit to install sub-meters in new construction (See http://www.sdnn.com/sandiego/2010-04-02/politics-city-county-government/city-council-to-consider-new-water-meter-rules#ixzz0jyvjUjrD).

P150-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

614 (NEW)-P-OSANN

P151 – 12

NUMBER NOT USED

P151-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

P152 – 12
701.7

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Delete without substitution:

~~**701.7 Connections.** Direct connection of a steam exhaust, blowoff or drip pipe shall not be made with the building drainage system. Waste water where discharged into the building drainage system shall be at a temperature not greater than 140°F (60°C). Where higher temperatures exist, *approved* cooling methods shall be provided.~~

Reason: This section was added to be consistent with Section 803.1. Section 803.1 dates back to the A40.8-1955 National Plumbing Code. The requirement for limiting the temperature of the hot water was based on concerns that temperatures above 140 degrees will remove the galvanizing from galvanized steel pipe. Today, there are numerous other piping materials used for sanitary drainage systems. Most piping materials can handle waste temperatures in excess of 140 degrees.

The last sentence has no meaning since there are no approved cooling methods identified. The common method is adding cold water to the waste stream. However, this is an unnecessary waste of water.

Cost Impact: This change does not increase the cost of construction.

P152-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

701.7-P-BALLANCO

P153 – 12

Table 702.1, Table 702.2, Table 702.4, Chapter 14

Proponent: Brian Conner, Charlotte Pipe and Foundry Company (bconner@charlottepipe.com)

Revise as follows:

TABLE 702.1
ABOVE-GROUND DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM F 2618

(Portions of table not shown remain unchanged)

TABLE 702.2
UNDERGROUND BUILDING DRAINAGE AND VENT PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM F 2618

(Portions of table not shown remain unchanged)

TABLE 702.4
PIPE FITTINGS

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic	ASTM F 2618

(Portions of table not shown remain unchanged)

Add new standard to Chapter 14 as follows:

ASTM
F 2618-09 Standard for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical waste Drainage Systems

Reason: CPVC Chemical waste pipe has been used in hundreds of installations throughout the country without the presence of standard or inclusion in the code. Adding this consensus standard to the code to the tables indicated takes the guesswork out of the hands of the code officials as to whether they should allow it as an alternative material.

Cost Impact: This proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F 2618-09 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P153-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T702.1-P-CONNER

P154 – 12
701.10 (New)

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute representing self

Add new text as follows:

701.10 Inspections. Where sanitary drainage piping penetrates a fire resistance rated wall, a fire resistance rated floor or a fire resistance rated ceiling, the piping shall be inspected before and after the installation of fire stopping material to verify that the piping system has not been modified.

Reason: This change is proposed to assure that the installation of the piping is not altered during the installation of fire stopping materials.

Cost Impact: The code change proposal will not increase the cost of construction

P154-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

701.10 (NEW)-P-LEVAN

P155 – 12/13
702.5 (New), 803.1

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self

Revise as follows:

702.5 Temperature rating. Where the wastewater temperature will be greater than 140°F (60°C), the sanitary drainage piping material shall be rated for the highest temperature of the wastewater.

~~**803.1 Waste water temperature.** Steam pipes shall not connect to any part of a drainage or plumbing system and water above 140°F (60°C) shall not be discharged into any part of a drainage system. Such pipes shall discharge into an indirect waste receptor connected to the drainage system.~~

Reason: Section 803.1 dates back to the A40.8-1955 National Plumbing Code. The requirement for limiting the temperature of the hot water was based on concerns that temperatures above 140 degrees will remove the galvanizing from galvanized steel pipe. Today, there are numerous other piping materials used for sanitary drainage systems. Most piping materials can handle waste temperatures in excess of 140 degrees.

In the 1950's, the means of cooling waste water was the addition of cold water. This is a waste of water that the code no longer permits.

Cost Impact: This change does not increase the cost of construction.

P155-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

702.5 (NEW)-BALLANCO

P156 – 12
702.7

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute, representing self

Add new text as follows:

702.7 Cast iron soil pipe, fittings and mechanical joint hubless couplings. Upon request by the code official, certificates of conformance shall be provided by the manufacturer to the code official indicating that cast iron pipe, cast iron fittings and mechanical joint hubless couplings are in compliance with Sections 705 and 702.

Reason: This will ensure the purchaser and/or owner meet or exceed the requirements of the code and manufacturer requirements.

P156-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

702.7 (NEW)-P-LEVAN

P157 – 12
703.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee, the Virginia Plumbing and Mechanical Inspectors Association (VPMIA), the Virginia Building Code Officials Association (VBCOA) and ICC Region 7.

Revise as follows:

703.1 Building sewer pipe near the water service. ~~Where the building sewer is installed within 5 feet (1524 mm) of the water service, the installation shall comply with the provisions of Section 603.2.~~ The proximity of a sewer to a water service shall comply with Section 603.2.

Reason: This section only triggers Section 603.2 if the sewer is 5 feet or less from the water service. If the building sewer and water service are more than 5 foot apart, the reader is not referred back to Section 603.2 which requires that the separation be of undisturbed or compacted earth. In other words, Section 703.1 would allow for a building sewer and water service to be in a wide trench without undisturbed/compacted earth between. This would violate the requirements of Section 603.2. The solution to this problem is simply to refer the reader back to the section that requires the separation so that there is no question that the five foot of separation is of compacted or undisturbed earth.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P157-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.1-P-STRAUSBAUGH.PMGCAC

P158 – 12
703.6 (New), 1109, 1109.1

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Add new text as follows:

<u>**703.6 Combined sanitary and storm public sewer.** Where the public sewer is a combined system for both sanitary and storm water, the sanitary sewer shall be connected independently to the public sewer.</u>

Revise as follows:

SECTION 1109
COMBINED SANITARY AND STORM ~~SYSTEM~~ <u>PUBLIC SEWER</u>

1109.1 ~~**Size of combined drains and sewers.** The size of a combination sanitary and *storm drain* or se*wer s*hall be computed in accordance with the method in Section 1106.3. The fixture units shall be converted into an equivalent projected roof or paved area. Where the total fixture load on the combined drain is less than or equal to 256 fixture units, the equivalent drainage area in horizontal projection shall be taken as 4,000 square feet (372 m2). Where the total fixture load exceeds 256 fixture units, each additional fixture unit shall be considered the equivalent of 15.6 square feet (1.5 m2) of drainage area. These values are based on a rainfall rate of 1 inch (25 mm) per hour.~~ <u>**General.** Where the public sewer is a combined system for both sanitary and storm water, the storm sewer shall be connect independently to the public sewer.</u>

Reason: The section on combined sanitary and storm systems implies that the two systems are combined inside the building. Hence, the need for some language to reflect how the combined piping is sized. However, when a combined sewer is only available, the connections are made separately to the public sewer. The combined system is in the street. Only older cities have combined sewers. Even these cities strive to separate the sewers. As such, the building connection must be separate to allow for the easy change over to a two sewer system.

The proposed change adds a requirement to Chapter 7 since there is no text regarding combined system. The text in Chapter 11 is modified to be consistent with the proposed new text in Chapter 7.

Cost Impact: This change does not increase the cost of construction.

P158-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

703.6 (NEW)-P-BALLANCO

P159 – 12

705 (New)

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

SECTION 705
REPLACEMENT OF UNDERGROUND SEWERS
BY PIPE BURSTING METHODS

705.1 General. This section shall govern the replacement of existing building sewer piping by pipe-bursting methods.

705.2 Applicability. The replacement of building sewer piping by pipe bursting methods shall be limited to gravity drainage piping of sizes 6 inches and smaller. The replacement piping shall be of the same nominal size as the existing piping.

705.3 Pre-installation inspection. The existing piping sections to be replaced shall be inspected internally by a recorded video camera survey. The survey shall include notations of the position of cleanouts and the depth of connections to the existing piping.

705.4 Pipe. The replacement piping shall be of extra high molecular weight PE3408 material and shall be manufactured with an SDR of 17 and in compliance with ASTM F 714.

705.5 Pipe fittings. Pipe fittings to be connected to the replacement piping shall be of extra high molecular weight PE3408 material and shall be manufactured with an SDR of 17 and in compliance with ASTM D2683.

705.6 Cleanouts. Where the existing building sewer did not have cleanouts meeting the requirements of this code, cleanout fittings shall be installed as required by this code.

705.7 Installation procedure. The installation procedure shall be in accordance with the following steps:

1. The existing pipe section to be replaced shall be cleaned of debris.
2. The beginning and end of the piping section to be replaced shall be exposed as necessary to enable pulling equipment to be properly installed and the replacement piping to be inserted without bending of the pipe at less than the minimum allowable bending radius as recommended by the pipe manufacturer.
3. A pulling cable shall be retrieved from the pulling end of the piping to be replaced and pulled to the insertion end of the piping to be replaced.
4. A pipe bursting and pulling head shall be connected to one end of the replacement piping. The bursting/pulling head shall be connected to the pulling cable.
5. In accordance with the pulling equipment and pipe bursting head manufacturer's operating instructions, the pipe bursting/pulling head shall be simultaneously operated and pulled through the existing piping until the end of the new piping exits at the pulling end of the operation.
6. The pipe bursting/pulling head shall be disconnected from the new piping and the pulling equipment removed from the area. The replacement piping ends shall be cut to length as required and shall be connected to the existing piping beyond the pipe section that was replaced. Connections to the ends of the replacement piping shall be in accordance with Section 705.
7. Where a connection to the replacement piping at a point between the pulling end and the insertion end of the pipe section that was replaced is required, the replacement piping shall be exposed at that location. A section of replacement piping shall be removed and a fitting of the appropriate configuration in accordance with Table 706.3 shall be installed. The connections between the fitting and the pipe shall be made in accordance with Section 705.16.

705.8 Post-installation inspection. The completed replacement piping section shall be inspected internally by a recorded video camera survey. The video survey shall be reviewed and approved by the code official prior to pressure testing of the replacement piping system.

705.9 Pressure testing. The replacement piping system as well as the connections to the replacement piping shall be tested in accordance with Section 312.

(Renumber subsequent sections)

Add new standards to Chapter 14 as follows:

ASTM

D2683-04	Standard Specification for Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.
F 714-06a	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) based on Outside Diameter.

Reason: The IPC lacks coverage concerning the replacement of sewer systems by pipe bursting methods. These methods are being widely used throughout the country. Proper guidance concerning this type of replacement provides additional value to the code.

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Cost Impact: None

Analysis: A review of the standards proposed for inclusion in the code, ASTM F 714-06a and ASTM D2683-04 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P159-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705 (NEW)-P-STRAUSBAUGH.PMGCAC

P160 – 12
705.5.2

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute , representing self (blevan@mindspring.com)

Revise as follows:

705.5.2 Compression gasket joints. Compression gasket joints for hub and spigot pipe and fittings shall conform to ASTM 564 and shall be tested to ASTM 1563. <u>Prior to installation, g</u>askets shall be <u>lubricated with lubricant recommended by the pipe and fitting manufacturer. Gaskets shall be</u> compressed when the pipe is fully inserted.

Reason: To allow easier and better insertion of the gasket into the pipe or fitting

Cost Impact: The code change proposal will not affect the cost of construction.

P160-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.5.2-P-LEVAN

P161 – 12
705.5.3

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute representing self (blevan@mindspring.com)

Revise as follows:

705.5.3 Mechanical joint coupling. Mechanical joint couplings for hubless pipe and fittings shall consist of an elastomeric sealing sleeve and a metallic shield that comply with CISPI 310, ASTM C1277 or ASTM C1540. The elastomeric sealing sleeve shall conform to ASTM C564 or CSA B602 and shall be provided with a center stop. Mechanical joint couplings shall be installed in accordance with the manufacturer's installation instructions.

Reason: The metallic shield coupling provides protection for the elastomeric sealing sleeve and provides shear strength for the system.

Cost Impact: The code change proposal will not increase the cost of construction.

P161-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.5.3-P-LEVAN

P162 – 12
705.7, 705.7.1, 705.7.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Delete without substitution:

~~**705.7 Coextruded composite ABS pipe, joints.** Joints between coextruded composite pipe with an ABS outer layer or ABS fittings shall comply with Sections 705.7.1 and 705.7.2.~~

~~**705.7.1 Mechanical joints.** Mechanical joints on drainage pipe shall be made with an elastomeric seal conforming to ASTM C1173, ASTM D 3212 or CSA B602. Mechanical joints shall not be installed in above-ground systems, unless otherwise approved. Joints shall be installed in accordance with the manufacturer's instructions.~~

~~**705.7.2 Solvent cementing.** Joint surfaces shall be clean and free from moisture. Solvent cement that conforms to ASTM D 2235 or CSA B181.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet. Joints shall be made in accordance with ASTM D 2235, ASTM D 2661, ASTM F 628 or CSA B181.1. Solvent cement joints shall be permitted above or below ground.~~

Reason: ABS pipe can be made by several different methods. The manufacturing method of an ABS pipe has nothing to do with how the pipe is joined. All forms of ABS pipe are joined by the joining method for ABS pipe, Section 705.2. These sections are redundant and should be deleted.

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Cost Impact: None

P162-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.7-P-STRAUSBAUGH.PMGCAC

P163 – 12
705.8, 705.8.1, 705.8.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Delete without substitution:

~~**705.8 Coextruded composite PVC pipe.** Joints between coextruded composite pipe with a PVC outer layer or PVC fittings shall comply with Sections 705.8.1 and 705.8.2.~~

~~**705.8.1 Mechanical joints**. Mechanical joints on drainage pipe shall be made with an elastomeric seal conforming to ASTM D 3212. Mechanical joints shall not be installed in above-ground systems, unless otherwise approved. Joints shall be installed in accordance with the manufacturer's instructions.~~

~~**705.8.2 Solvent cementing**. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent cement joints shall be permitted above or below ground.~~

Reason: PVC pipe can be made by several different methods. The manufacturing method of a PVC pipe has nothing to do with how the pipe is joined. All forms of PVC pipe are joined by the joining method for PVC pipe, Section 705.14. These sections are redundant and should be deleted.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P163-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.8-P-STRAUSBAUGH.PMGCAC

P164 – 12
705.8.2, 705.14.2

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (mikec@cmservnet.com)

Revise as follows:

705.8.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where both of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in non-pressure applications in sizes up to and including 4 inch (102 mm) in diameter.

705.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTMD2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where both of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in non-pressure applications in sizes up to and including 4 inch (102 mm) in diameter

Reason: To introduce an exception in chapter 7, Sanitary Drainage, allowing for the practice of one-step solvent cementing of non-pressure DWV systems 4" and under.

This exception allows for an optional one-step procedure for joining non-pressure DWV PVC piping systems 4" in diameter and below with solvent cement conforming to ASTM D 2564. This method is practiced, and the code should include specific language to indicate when it is acceptable.

Pressure testing completed by NSF International has shown that solvent cement conforming to ASTM D 2564, when used without primer on PVC DWV pipe and fittings, both solid wall and cell core, generates bonding forces well in excess of what is required for these systems. The strength of the joint often exceeds the pipe and fitting pressure capacity.

Bibliography: NSF International report J-00036842.can be found on the PPFA website, www.ppfahome.org//ICC09/PPFA_NSF_J-00036842.pdf

Cost Impact: None

P164-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.8.2-P-CUDAHY

P165 – 12

705.9, 705.9.1, 705.9.2, 705.9.3, 705.9.4, 705.9.5, 705.10, 705.10.1, 705.10.2, 705.10.3

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting representing The Copper Development Association (penniefeehan@me.com)

Revise as follows:

705.9 Copper pipe and tubing. Joints between copper or copper-alloy pipe, tubing, and ~~or~~ fittings shall comply with one of the methods indicated in Sections 705.9.1 through 705.9.5.

705.9.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with a brazing alloy having a liquid temperature exceeding 1000˚F (538˚C). ~~All~~ Joint surfaces to be brazed shall be cleaned bright by manual or mechanical means. The ends of pipe or tubing shall be cut square and shall be reamed to the full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Where required by the brazing alloy manufacturer's instructions, an approved brazing flux shall be applied to the joint surfaces. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

705.9.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall include compression type, flanged type, grooved type and press type.

705.9.3 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ The ends of pipe or tub~~e~~ing shall be cut square and shall be reamed to the full inside diameter of the pipe or tub~~e~~ing. ~~end.~~ Burrs on the outside end of the pipe or tubing shall be removed. ~~All~~ Joint surfaces to be soldered shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to the pipe or tubing and fittings. Such flux shall be noncorrosive and nontoxic after soldering. ~~be applied.~~ Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air /fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and the pipe or tubing. Solder in compliance with ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. ~~The joint shall be soldered with a solder conforming to ASTM B 32.~~ The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint.

705.9.4 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

705.9.5 Welded joints. ~~All~~ Welded joint surfaces shall be cleaned. The joint shall be welded with ~~an~~ *approved* filler metal.

~~**705.10 Copper tubing.** Joints between copper or copper alloy tubing or fittings shall comply with Sections 705.10.1 through 705.10.3.~~

~~**705.10.1 Brazed joints.** All joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.~~

~~**705.10.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

~~**705.10.3 Soldered joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32.~~

(Renumber subsequent sections)

Reason: The above language combines pipe and tubing into one section and provides the joining methods of copper and copper alloys as referenced in Table 702.4. In addition, important language from the standards has been added to aid the end user.

Cost Impact: This code change will not increase the cost of construction.

P165-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.9-P-FEEHAN

AS SUBMITTED:

P_________ – 12

705.9, 705.9.1, 705.9.2, 705.9.3, 705.9.4, 705.9.5, 705.10, 705,10.1, 705.10.2, 705.10.3

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting representing The Copper Development Association

Revise as follows:

705.9 Copper pipe and tubing. Joints between copper or copper-alloy pipe, tubing, and ~~or~~ fittings shall comply with Sections 705.9.1 through 705.9.5

705.9.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with brazing alloys having a liquid temperature above 1000˚F (538˚C). All joint surfaces to be brazed shall be cleaned bright by either manual or mechanical means. Tubing shall be cut square and reamed to full inside diameter. An approved brazing flux shall be applied to the joint surfaces where required by manufacturer's recommendation. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal and shall be applied at the point where the pipe or tubing enters the socket of the fitting.

705.9.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Joints shall include compression, flanged, grooved, press, and threaded.

705.9.3 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation as follows: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ Pipe or tub~~e~~ing ~~ends~~ shall be cut square and reamed to the full inside diameter including the removal of burrs on the outside of the pipe and tub~~e~~ing. ~~end.~~ ~~All~~ Joint surfaces to be joined shall be cleaned bright by manual or mechanical means. ~~A f~~Flux shall be applied to pipe or tubing and fittings and shall be in accordance with ~~conforming to~~ ASTM B 813 and shall become noncorrosive and nontoxic after soldering ~~be applied~~. Insert pipe or tubing into the base of the fitting and remove excess flux. Pipe or tubing and fitting shall be supported to ensure a uniform capillary space around the joint. Heat shall be applied using an air or fuel torch with the flame perpendicular to the pipe or tubing using acetylene or an LP gas. Preheating shall depend on the size of the joint. The flame shall be moved to the fitting cup and alternate between the pipe or tubing and fitting. The joint shall be soldered with a solder in accordance with ~~conforming to~~ ASTM B 32 and shall be applied to the joint surfaces until capillary action draws the molten solder into the cup. Joint surfaces shall not be disturbed until cool and any remaining flux residue shall be cleaned.

705.9.4 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

705.9.5 Welded joints. ~~All~~ Welded joint surfaces shall be cleaned. The joint shall be welded with ~~an~~ approved filler metal.

~~**705.10 Copper tubing.** Joints between copper or copper alloy tubing or fittings shall comply with Sections 705.10.1 through 705.10.3.~~

~~**705.10.1 Brazed joints.** All joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.~~

~~**705.10.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

~~**705.10.3 Soldered joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32.~~

Renumber subsequent sections

Reason: The above language combines pipe and tubing into one section and provides the joining methods of copper and copper alloys as referenced in Table 702.4. In addition, important language from the standards has been added to aid the end user.

Cost Impact: This code change will not increase the cost of construction.

P_-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

705.9-FEEHAN

P166 – 12
706.3, Table 706.3

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee (Sstrausbaugh@arlingtonva.us)

Delete and substitute as follows:

~~**706.3 Installation of fittings.** Fittings shall be installed to guide sewage and waste in the direction of flow. Change in direction shall be made by fittings installed in accordance with Table 706.3. Change in direction by combination fittings, side inlets or increasers shall be installed in accordance with Table 706.3 based on the pattern of flow created by the fitting. Double sanitary tee patterns shall not receive the discharge of back-to-back water closets and fixtures or appliances with pumping action discharge.~~

> ~~**Exception:** Back-to-back water closet connections to double sanitary tees shall be permitted where the horizontal developed length between the outlet of the water closet and the connection to the double sanitary tee pattern is 18 inches (457 mm) or greater.~~

706.3 Installation of fittings. Changes in the direction of flow in drainage piping shall be made by fittings installed in an orientation that directs the drainage in the direction of flow. The following are prohibited applications of fittings:

1. A cast iron quarter bend or short sweep elbow smaller than 3 inches shall not be used for a vertical-to-horizontal or horizontal-to-horizontal change in direction of flow except where conveying flow from a single fixture drain.
2. A cast iron quarter bend or short sweep elbow that is 3 inches and larger shall not be used for a horizontal-to-horizontal change in direction of flow.
3. A plastic quarter bend elbow smaller than 3 inches, other than a long sweep quarter bend elbow, shall not be used for a vertical-to-horizontal or horizontal-to-horizontal change in direction of flow except where conveying flow from a single fixture drain.
4. A plastic quarter bend elbow that is 3 inches and larger, other than a long sweep quarter bend elbow, shall not be used for a horizontal-to-horizontal change in direction of flow.
5. A heel inlet of a quarter bend elbow shall not receive the discharge from any fixture where the elbow receives the discharge of a water closet and changes the flow direction from vertical-to-horizontal .
6. A low-heel inlet of a quarter bend elbow shall not be used as a connection for a wet vent or wet vented fixture where the elbow changes the flow direction from vertical-to-horizontal.
7. The side inlet of a quarter bend elbow shall not be used as a drainage connection where the elbow changes the flow direction from horizontal to horizontal.
8. A sanitary tee shall not be used in an orientation where the run of the tee is in the horizontal plane, or an angle less than 45 degrees thereto, except where the branch of the tee serves as a dry vent.
9. A double sanitary tee shall not receive the discharge of water closets through both branches nor shall it receive pumped waste flow in either branch.

   Exception: Water closets shall be permitted to connect to both branches of a double sanitary tee where the horizontal developed length between the outlet of each water closet and the connection to the double sanitary tee is 18 inches (457 mm) or greater.

Reason: The existing section and accompanying table are unclear as to how the table is to be used and exactly what the prohibitions of fitting uses are. The problem is that the table is too limiting and does not address the materials of the fittings relative to the pattern (i.e. short sweep versus quarter bend). Also, the table doesn't address the use of a drainage fitting where a branch is used as vent connection (e.g. sanitary tee). The text proposed clearly indicates the specific prohibitions and uses in mandatory language.

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Cost Impact: None

P166-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

706.3-P-STRAUSBAUGH.PMGCAC

P167 – 12
707.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

707.1 Prohibited joints. The following types of joints and connections shall be prohibited:

1. Cement or concrete joints.
2. Mastic or hot-pour bituminous joints.
3. Joints made with fittings not *approved* for the specific installation.
4. Joints between different diameter pipes made with elastomeric rolling O-rings.
5. Solvent-cement joints between different types of plastic pipe.
6. Saddle-type fittings.
7. <u>Where a pipe or fitting is inserted inside of another pipe.</u>

Reason: This proposed new item intends to prevent the misapplication of fittings and pipe of all materials. The IRC already prohibits the installation of a 4 x 3 plastic closet flange into the inside of a 4 inch plastic pipe. (Section P3003.19) . The reason for this is that the internal diameter of DWV plastic pipe is not controlled during manufacturing which results in a non-uniform and sometimes wavy surface inside of the pipe. Such surface was never intended to be part of solvent welded joint. The inside surface of fitting sockets are precisely controlled during manufacturing because they are designed to be part of a solvent welded joint, but this is not for the ID of pipe. If pipe or fittings are misapplied by attempting solvent weld joints in the inside of pipe, poorly made joints will result which are mechanically weak and prone to failure or leakage in service. Leakage may not be detected during DWV testing because closet flanges are commonly installed *after* testing and also because a poorly made weak joint could survive the test and fail at a later time as the piping system expands and contracts, ages and moves from building settlement. This problem is not limited to closet flanges as installers have attempted to install other fittings such as wyes inside of pipe.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P167-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

707.1-P-STRAUSBAUGH.PMGCAC

P168 – 12
708

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Delete and substitute as follows:

~~**SECTION 708**~~
~~**CLEANOUTS**~~

SECTION 708
CLEANOUTS

708.1 Cleanouts required. Cleanouts shall be provided for drainage piping in accordance with Sections 708.1.1 through 708.1.11.

708.1.1 Horizontal drains and building drains. Horizontal drainage pipes in buildings shall have cleanouts located at intervals of not more than 100 feet (30 480 mm). Building drains shall have cleanouts located at intervals of not more than100 feet (30 480 mm) except where manholes are used instead of cleanouts, the manholes shall be located at intervals of not more than 400 feet (122 m). The interval length shall be measured from the cleanout or manhole opening, along the developed length of the piping to the next drainage fitting providing access for cleaning, the end of the horizontal drain or the end of the building drain.

> **Exception:** Horizontal fixture drain piping serving a nonremovable trap shall not be required to have a cleanout for the section of piping between the trap and the vent connection for such trap.

708.1.2 Building sewers. Building sewers smaller than 8 inches (203 mm) shall have cleanouts located at intervals of not more than 100 feet (30 480 mm). Building sewers 8 inches (203 mm) and larger shall have a manhole located not more than 200 feet (60 960 mm) from the junction of the building drain and building sewer and at intervals of not more than 400 feet (122 m). The interval length shall be measured from the cleanout or manhole opening, along the developed length of the piping to the next drainage fitting providing access for cleaning, a manhole or the end of the building sewer.

708.1.3 Building drain and building sewer junction. The junction of the building drain and the building sewer shall be served by a cleanout that is located at the junction or within 10 feet (3048 mm) developed length of piping upstream of the junction. For the requirements of this section, the removal of water closet shall not be required to provide cleanout access.

708.1.4 Changes of direction. Where a horizontal drainage pipe, a building drain or a building sewer has a change of horizontal direction greater than 45 degrees (0.79 rad), a cleanout shall be installed at the change of direction. Where more than one change of horizontal direction greater than 45 degrees (0.79 rad) occurs within 40 feet (12 192 mm) of developed length of piping, the cleanout installed at the first change of direction shall serve as the cleanout for all changes in direction within that 40 feet (12 192 mm) of developed length of piping.

708.1.5 Cleanout size. Cleanouts shall be the same size as the piping served by the cleanout except cleanouts for piping larger than 4 inches (102 mm) need not be larger than 4 inches (102 mm).

> **Exceptions:**
>
> 1. A removable P- trap with slip or ground joint connections can serve as a cleanout for drain piping that is one size larger than the P-trap size.
> 2. Cleanouts located on stacks can be one size smaller than the stack size.

3. The size of cleanouts for cast-iron piping can be in accordance with the referenced standards for cast iron fittings as indicated in Table 702.4.

708.1.6 Cleanout plugs. Cleanout plugs shall be brass, plastic or other approved materials. Cleanout plugs for borosilicate glass piping systems shall be of borosilicate glass. Brass cleanout plugs shall conform to ASTM A74 and shall be limited for use only on metallic piping systems. Plastic cleanout plugs shall conform to the referenced standards for plastic pipe fittings as indicated in Table 702.4. Cleanout plugs shall have a raised square head, a countersunk square head or a countersunk slot head. Where a cleanout plug will have a trim cover screw installed into the plug, the plug shall be manufactured with a blind end threaded hole for such purpose.

708.1.7 Manholes. Manholes and manhole covers shall be of an approved type. Manholes located inside of a building shall have gas-tight covers that require tools for removal.

708.1.8 Installation arrangement. The installation arrangement of a cleanout shall enable cleaning of drainage piping only in the direction of drainage flow.

Exceptions:

1. Test tees serving as cleanouts.
2. A two-way cleanout installation that is approved for meeting the requirements of Section 708.1.3.

708.1.9 Required clearance. Cleanouts for 6-inch (153 mm) and smaller piping shall be provided with a clearance of not less than 18 inches (457 mm) from, and perpendicular to, the face of the opening to any obstruction. Cleanouts for 8-inch (203 mm) and larger piping shall be provided with a clearance of not less than 36 inches (914 mm) from, and perpendicular to, the face of the opening to any obstruction.

708.1.10 Cleanout access. Required cleanouts shall not be installed in concealed locations. For the purposes of this section, concealed locations include, but are not limited to, the inside of plenums, within walls, within floor/ceiling assemblies, below grade and in crawl spaces where the height from the crawl space floor to the nearest obstruction along the path from the crawl space opening to the cleanout location is less than 24 inches (610 mm). Cleanouts with openings at a finished wall shall have the face of the opening located within 1-1/2 inches (38 mm) of the finished wall surface. Cleanouts located below grade shall be extended to grade level so that the top of the cleanout plug is at or above grade. A cleanout installed in a floor or walkway that will not have a trim cover installed shall have a countersunk plug installed so the top surface of the plug is flush with the finished surface of the floor or walkway.

708.1.10.1 Cleanout plug trim covers. Trim covers and access doors for cleanout plugs shall be designed for such purposes and shall be approved. Trim cover fasteners that thread into cleanout plugs shall be corrosion resistant. Cleanout plugs shall not be covered with mortar, plaster or any other permanent material.

708.1.10.2 Floor cleanout assemblies. Where it is necessary to protect a cleanout plug from the loads of vehicular traffic, cleanout assemblies in accordance with ASME A112.36.2M shall be installed.

708.1.11 Prohibited use. The use of a threaded cleanout opening to add a fixture or extend piping shall be prohibited except where another cleanout of equal size is installed with the required access and clearance.

Reason: Section 708 is disorganized. For example, the second Section 708.2 discusses requirements for cleanout plugs. The more significant sections of the section are scattered throughout the remainder of the section in a disorganized fashion. This proposal reorganizes this section in a more logical format for ease of understanding.

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Cost Impact: None

P168-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

708-P-STRAUSBAUGH.PMGCAC

P169 – 12
708.4, 708.8

Proponent: Dennis Gardner, State of Colorado plumbing inspector representing self.

Revise as follows:

708.4 Concealed piping. Cleanouts on concealed piping or piping under a floor slab or in a crawl space of less than ~~24 inches (610 mm)~~ 36 inches (914 mm) in height or a plenum shall be extended through and terminate flush with the finished wall, floor or ground surface or shall be extended to the outside of the building. Cleanout plugs shall not be covered with cement, plaster or any other permanent finish material. Where it isnecessary to conceal a cleanout or to terminate a cleanout in an area subject to vehicular traffic, the covering plate, *access* door or cleanout shall be of an *approved* type designed and installed for this purpose.

708.8 Clearances. Cleanouts on ~~6-inch (153 mm)~~ 3 inches (76 mm) and smaller pipes shall be provided with a clearance of not less than 18 inches (457 mm) for rodding. ~~Cleanouts on 8-inch (203 mm) and larger pipes shall be provided with a clearance of not less than 36 inches (914 mm) for rodding.~~ *C*leanouts for piping 4 inches (102mm) and larger shall be provided with a working space in front of the cleanout and such waorkign space shall be not less than 36 inches (914 mm) wide by 36 inches (914 mm) high by 36 inches (914 mm) deep. Fixtures shall not encroach upon such working space.

Reason: The definition of *access* in regards to the location of a cleanout is inappropriate language for clearances for operating a cleaning machine without the risk of harm to the operator of the equipment or the property. I recently had a 4 inch cleanout between a wall and the water closet set 18 inches from the wall. It gives the 18 inches mandatory clearance in front as required by code but does not give adequate *access* to be used. You would think common sense would prevail but without the proper guidelines winning a battle with contractors, architects or engineers who have never worked in the field or won't admit they are wrong, makes the call impossible to enforce and the cleanout impossible to use. To just use the term (*Access* shall be provided to all cleanouts*) is grossly inadequate.*

None: The cleanouts are already required by code it is just making the code clearer insuring cleanouts are accessible for use as the code has intended.

P169-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

708.4-P-GARDNER

P170 – 12
712.3.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

712.3.2 Sump pit. The sump pit shall be not less than 18 inches (457 mm) in diameter and not less than 24 inches (610 mm) in depth, unless otherwise approved. The pit shall be accessible and located such that all drainage flows into the pit by gravity. The sump pit shall be constructed of tile, concrete, steel, plastic or other approved materials. The pit bottom shall be solid and provide permanent support for the pump. The sump pit shall be fitted with a gas-tight removable cover that is <u>installed flush with grade or above grade. The cover shall be </u>adequate to support anticipated loads in the area of use. The sump pit shall be vented in accordance with Chapter 9.

Reason: The cover for sump pits needs to be located at grade or above grade. Otherwise, there is nothing to prevent an installation where the cover is located below grade in a well such that in order to service the pump, someone has to stand on his head in order to just remove the sump pit cover. Requiring the cover to be at or above grade eliminates this problem.

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Cost Impact: None

P170-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

712.3.2-P-STRAUSBAUGH.PMGCAC

P171 – 12
713.12 (New)

Proponent: Daniel D. Fish, Roda LLC, representing self (info@drainbrain.us)

Add new text as follows:

713.12 Wastewater leak containment, detection and notification. An early-warning wastewater leak containment, detection and notification device shall be required in hospitals and other healthcare occupancies stated in section 713.1. This device shall contain and detect a wastewater leak in the building's water closets, showers and bathtubs. This device shall be equipped with an auditory alarm, visual signal, and a means for notification to the affected building occupants, property owners or the property management staff. The auditory alarm shall have a sound pressure level rating of not less than 85 dB when measured at a distance of ten feet.

Reason: Millions of wastewater leaks occur every year in multi-story buildings from leaking drains, waste lines, and toilets. Toilets are especially high risks for water leakage. Research has shown that 30 percent of all toilets in the United States leak. Toilets with unreliable wax gaskets and flanges – a common problem – cause the most damage to the unit below. Also, the float valve that controls water entering the toilet tank often malfunction, which allows water to run into toilet waste line continuously.

Wastewater leaks typically go undetected until considerable damage has been done. These leaks: (1) waste millions of gallons of water, (2) damage property/materials, generating millions of tons of debris that swells landfills, and (3) develop mold on building components, creating property damage and a health hazard. Property owners spend millions of dollars to repair the damage from wastewater leaks and cure mold-related problems.

An early-warning wastewater leak containment, detection, and notification device will give building occupants and facility managers/owners the opportunity to avoid wastewater leak damage and its attendant costs. Taking action early will conserve millions of gallons of water and eliminate the environmental, economic, and health hazards from wastewater leaks. This solution for the age-old wastewater leak problem will meet the intent of this code by safeguarding the public health, safety, and welfare.

Cost Impact: The code change proposal will not increase the cost of construction.

P171-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

713.12 (NEW)-P-FISH

P172 – 12
715.1

Proponent: Thomas C. Pitcherello, N.J. Department of Community Affairs, representing self (tpitcherello@dca.state.nj.us)

Revise as follows:

715.1 Sewage backflow. Where plumbing fixtures are installed on a floor with a finished floor elevation below the elevation of the manhole cover of the next upstream manhole in the *public sewer,* such fixtures shall be protected by a backwater valve installed in the *building drain,* or horizontal *branch* serving such fixtures. Plumbing fixtures installed on a floor with a finished floor elevation above the elevation of the manhole cover of the next upstream manhole in the *public sewer* shall not discharge through a backwater valve.

> **Exception:** In existing buildings, fixtures above the elevation of the manhole cover of the next upstream manhole in the *public sewer* shall not be prohibited from discharging through a backwater valve.

Reason: Building owners who have experienced a sewage backup in a building that was caused by problems in an existing public sewer main should be allowed to install a backwater valve in the building drain or sewer to protect their property. Having a basement full of raw sewage is an experience that no one wants to repeat. The requirement that only those fixtures that are on a floor elevation below the top of the next upstream manhole in the public sewer are allowed to discharge through the BWV, places a significant impediment for the building owner to protect his property against an event over which currently he has no control. For example, consider an existing two story hotel with multiple stacks connecting to a building drain. The fixtures on the lower floor are connected to the same building drain. The existing code language would require that all of the stacks be rerouted to connect downstream of a backwater valve installed to serve only the fixtures on the lower floor level. This would be cost prohibitive to do. The simpler solution would be to just install the BWV in the building drain or sewer. However, as the code is currently written, this is prohibited. The main reason why the code prohibits this is so that the discharge from upper floors does not flood the lower floor when the building sewer is backed up. If the BWV serves only the lower elevation fixtures, it would be closed when the sewer backed up and any discharge from higher elevation fixtures could not flow out of the lower elevation fixtures. BWV's are not known to create problems in a building sewer; rather, they provide protection from sewage backups and provide peace of mind for the building owners and occupants. Although the current code requirement can be easily accomplished in new construction, it is a hardship for those building owners who need protection for existing buildings. Imagine the work that would be necessary to separate the building drain into different sub building drains in an existing building with piping under slab floors.

Cost Impact: The code change proposal will not increase the cost of construction.

P172-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

715.1-P-PITCHERELLO

P173 – 12
716 (New), Chapter 14

Proponent: Jeremy Brown, NSF International (brown@nsf.org)

Add new text as follows:

SECTION 716
CURED-IN-PLACE PIPE LINERS

716.1 Approval. Cured-in-place pipe liner materials shall conform to NSF-14.

716.2 Installation. Installation of cured-in-place pipe liners shall be in accordance with the manufacturer's instructions and ASTM F1216, ASTM F1783 or ASTM F 2019.

Add new standards to Chapter 14 as follows:

ASTM

F1216-09	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin Impregnated Tube
F1743-08	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP)
F2019-11	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP).

Reason: Trenchless technology is commonly used to rehabilitate existing drain and sewer lines. This proposal establishes requirements by referring to appropriate standards for the materials and installation.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ASTM F1216-09, ASTM F1743-08 and ASTM F2019-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P173-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716 (NEW)-P-BROWN

P174– 12
716 (New), Appendix C

Proponent: David R. Scott, AIA, representing Target Corporation.

Delete without substitution:

~~**APPENDIX C**~~
~~**VACUUM DRAINAGE SYSTEM**~~

(Renumber subsequent Appendices)

Add new text as follows:

SECTION 716
VACUUM DRAINAGE SYSTEMS

716.1 Scope. Vacuum drainage systems shall be in accordance with Sections 716.2 through 716.4.

716.2 System design. Vacuum drainage systems shall be designed in accordance with the vacuum drainage system manufacturer's instructions. The system layout, including piping layout, tank assemblies, vacuum pump assembly and other components necessary for proper function of the system shall be in accordance with the manufacturer's instructions. Plans, specifications and other data for such systems shall be submitted to the code official for review and approval prior to installation.

716.2.1 Fixtures. Gravity-type fixtures installed in vacuum drainage systems shall comply with Chapter 4.

716.2.2 Drainage fixture units. Fixture units for gravity drainage systems which discharge into or receive discharge from vacuum drainage systems shall be based on the values in Chapter 7.

716.2.3 Water supply fixture units. Water supply fixture units shall be based on values in Chapter 6 of this code except that the water supply fixture unit for a vacuum-type water closet shall be 1.

716.2.4 Traps and cleanouts. Gravity drainage fixtures shall be provided with traps and cleanouts in accordance with Chapters 7 and 10.

716.2.5 Materials. Vacuum drainage pipe, fitting and valve materials shall be in accordance with the vacuum drainage system manufacturer's instructions and the requirements of Chapter 7.

716.3 Testing and demonstrations. After completion of the entire system installation, the system shall be subjected to a vacuum test of 19 inches (483 mm) of mercury and shall be operated to function as required by the code official and the manufacturer of the vacuum drainage system. Recorded proof of all tests shall be submitted to the code official.

716.4 Written instructions. Written instructions for the operation, maintenance, safety and emergency procedures shall be provided to the building owner. The code official shall verify that the building owner is in receipt of such instructions.

Reason: Vacuum drainage system is a proven technology and should be allowed for situations where draining by gravity is prohibitive or not possible. Moving this information into Chapter 7 will allow for acceptance of vacuum drainage systems in jurisdictions that have not adopted the appendices.

Cost Impact: The code change proposal will not increase the cost of construction.

P174-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716-P-SCOTT

P175 – 12
802.1, 802.1.8

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

802.1 Where required. Food-handling equipment <u>in other than dwelling units</u>, and clearwater waste shall discharge through an indirect waste pipe as specified in Sections 802.1.1 through 802.1.8. Health-care related fixtures, devices and equipment shall discharge to the drainage system through an indirect waste pipe by means of an air gap in accordance with this chapter and Section 713.3. Fixtures not required by this section to be indirectly connected shall be directly connected to the plumbing system in accordance with Chapter 7.

802.1.8 Food utensils, dishes, pots and pans sinks. Sinks, <u>in other than dwelling units</u>, used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or service ware used in the preparation, serving or eating of food shall discharge indirectly through an air gap or an air break to the drainage system.

Reason: The current language requires that the waste discharge from food handling equipment as specified in Sections 802.1.1 through 802.1.8 in commercial and residential occupancies be indirectly connected. This should not be applicable for dwelling units but nonetheless, Section 802.1.1 requires fixtures (i.e. a kitchen sink in dwelling unit) to be indirectly connected. The IPC applies to multi-family dwelling buildings and is inappropriately requiring an indirect waste connection for a dwelling kitchen sink because such sink is used for food handling and ware washing (i.e. 802.1.1and 802.1.8).

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P175-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.1 #1-P-STRAUSBAUGH.PMGCAC

P176 – 12
802.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

802.1 Where required. Food-handling equipment, ~~and~~ clear-water waste, <u>dishwashing machines and utensil, pots, pans and dish washing sinks</u> shall discharge through an indirect waste pipe as specified in Sections 802.1.1 through 802.1.8. Health-care related fixtures, devices and equipment shall discharge to the drainage system through an indirect waste pipe by means of an air gap in accordance with this chapter and Section 713.3. Fixtures not required by this section to be indirectly connected shall be directly connected to the plumbing system in accordance with Chapter 7.

Reason: The subject of the first sentence of current Section 802.1 is food handling and clear water waste. This sentence introduces Subsections 802.1.6, 802.1.7 and 802.1.8, however, these sections are not food handling or clear-water related. Revising the first sentence of Section 802.1 corrects this inaccuracy.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P176-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.1 #2-P-STRAUSBAUGH.PMGCAC

P177 – 12
802.1.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

802.1.1 Food handling. Equipment and fixtures utilized for the storage, preparation and handling of food shall discharge through an indirect waste pipe by means of an air gap. <u>Each well of a multi-compartment sink shall discharge independently to a waste receptor.</u>

Reason: An all too common practice for drain connections to a multi-compartment sink is to manifold the drain piping together and run a single indirect waste pipe to the waste receptor. If one compartment is draining and another compartment is empty or less full , the waste flow can back up into the empty or less full compartment and contaminate that compartment. Requiring each well to discharge independently to the waste receptor prevents this potential for contamination.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P177-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.1.1-P-STRAUSBAUGH.PMGCAC

P178 – 12
802.1.6

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Revise as follows:

802.1.6 Domestic dishwashing machines. Domestic dishwashing machines shall discharge indirectly through an ~~*air gap* or~~ *air break* into a standpipe or waste receptor in accordance with Section 802.2, or discharge into a wye branch fitting on the tailpiece of the kitchen sink or the dishwasher connection of a food waste grinder. The waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste grinder ~~shall connect to a deck-mounted *air gap* or the waste line~~ shall rise ~~and be securely fastened~~ to the underside of the sink rim or counter.

Reason: The connection as an air gap qualifies as an air break, therefore, there is no need to mention air gap. A deck mounted air gap fitting is never necessary for the connection of a dishwasher. The code should not mention a connection that is not required. If someone wants to add an air gap fitting they are free to do so. The drain still rises to the underside of the sink. A requirement for securely fastened is inappropriate since there is no definition of securely fastened.

Cost Impact: This change does not increase the cost of construction.

P178-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.1.6-P-BALLANCO

P179 – 12
802.1.6, 802.1.7, 802.2, 802.2.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

802.1.6 Domestic dishwashing machines. Domestic dishwashing machines shall discharge indirectly through an *air gap* or *air break* into a ~~standpipe or~~ waste receptor in accordance with Section 802.2, or discharge into a wye branch fitting on the tailpiece of the kitchen sink or the dishwasher connection of a food waste grinder. The waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste grinder shall connect to a deck-mounted *air gap* or the waste line shall rise and be securely fastened to the underside of the sink rim or counter.

802.1.7 Commercial dishwashing machines. The discharge from a commercial dishwashing machine shall be through an *air gap* or *air break* into a ~~standpipe or~~ waste receptor in accordance with Section 802.2.

802.2 Installation. Indirect waste piping shall discharge through an *air gap* or *air break* into a waste receptor. Waste receptors ~~and standpipes~~ shall be trapped and vented and shall connect to the building drainage system. All indirect waste piping that exceeds 30 inches (762 mm) in developed length measured horizontally, or 54 inches (1372 mm) in total developed length, shall be trapped.

802.2.2 Air break. An *air break* shall be provided between the indirect waste pipe and the trap seal of the waste receptor ~~or standpipe~~.

Reason: Because a standpipe is a waste receptor, it is redundant to state “standpipe and waste receptor” in these sections. Therefore, the word standpipe is removed as waste receptors include standpipes. A companion code change proposal relocates Section 802.4 to be a subsection of 802.3, because standpipes are a type of waste receptor and belong with the other waste receptors.

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Cost Impact: None

P179-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.1.6-P-STRAUSBAUGH.PMGCAC

P180 – 12
802.3

Proponent: Dennis Gardner, State of Colorado Plumbing and Gas Inspector

Revise as follows:

802.3 Waste receptors. Waste receptors shall be of an *approved* type. A removable strainer or basket shall cover the outlet of the waste receptors. Waste receptors shall be installed in ~~ventilated~~ spaces <u>normally occupied by the occupants of the building.</u> Waste receptors shall not be installed in bathrooms, toilet rooms, plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors or in an inaccessible space or unventilated space such as a closet or storeroom. Ready *access* shall be provided to the waste receptors.

Reason: There has always been a question about what constitutes a ventilated space. I believe that the real intent of the code is to make sure that waste receptors will be located in areas that are frequented by the occupants of the building so that if there is a problem such as a backup, the occupants will notice the problem.

Cost impact: None

P180-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.3-P-GARDNER

P181 – 12
802.3

Proponent: Shawn Strausbaugh, Arlington County VA, representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Revise as follows:

802.3 Waste receptors. ~~Waste receptors shall be of an approved type.~~ For other than standpipes and hub drains, a removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall not be installed in ~~ventilated~~ concealed spaces. Waste receptors shall not be installed in ~~bathrooms, toilet rooms~~, plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors ~~or in any inaccessible or unventilated space such as a closet or storeroom~~. Ready access shall be provided to waste receptors.

Reason: This is a companion proposal with a newly added definition of waste receptor. We have attempted to identify exactly what constitutes an 'approved type" of waste receptor. The code fails to provide guidance as to what is a ventilated space, so we suggest removing the terms. This proposal takes the provisions in the direction of clear mandatory language that provides the user with terminology that clearly explains where a waste receptor is not permitted to be located. Further, there is no real problem associated with having a hub drain in a closet or storeroom where items such as water heaters and condensate producing appliances are located so that text has been removed.

Cost Impact: None

P181-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.3-P-STRAUSBAUGH

P182 – 12
202, 802.3, 802.3.2, 802.4

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new definition as follows:

WASTE RECEPTOR. A floor sink, standpipe, hub drain or a floor drain that receives the discharge of one or more indirect waste pipes.

Revise as follows:

802.3 Waste receptors. ~~Waste receptors shall be of an approved type.~~ For other than hub drains that receive only clear-water waste and standpipes, a removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall not be installed in ~~ventilated~~ concealed spaces. Waste receptors shall not be installed in ~~bathrooms, toilet rooms~~, plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors. ~~or in any inaccessible or unventilated space such as a closet or storeroom~~. Ready access shall be provided to waste receptors.

802.3.2 ~~Open~~ Hub drains ~~waste receptors~~. A hub drain~~Waste receptors~~ shall be ~~permitted~~ in the form of a hub or a pipe extending not less than 1 inch (25.4 mm) above a water-impervious floor. ~~and are not required to have a strainer.~~

~~802.4~~ 802.3.3 Standpipes. Standpipes shall be individually trapped. Standpipes shall extend not less than 18 inches (457 mm) but not greater than 42 inches (1066 mm) above the trap weir. *Access* shall be provided to all standpipes and drains for rodding.

Reason: A definition for "waste receptor" is needed. The term is found in the code 24 times with no exact description. The proposed definition identifies exactly what constitutes an 'approved type" of waste receptor. The code fails to provide guidance as to what is a ventilated space so the language was changed to prevent waste receptors from being installed in a concealed space. There is no logical reason to prohibit waste receptors from being installed in a bathroom or toilet room. It is not unusual for a clothes washing machine (requiring a standpipe) to be placed in a bathroom or a toilet room in a multifamily residential occupancy. Waste receptors (typically a hub drain) are frequently needed in closets or storerooms where appliances discharge condensate or where relief valve discharge pipes are located.. The term "open hub waste receptor" is redundant and unclear and was eliminated in favor of the more common term "hub drain". As a hub drain is a waste receptor, a strainer is required except where the hub drain receives only clear water wastes. Standpipes are just another breed of waste receptors and should be included as a subsection under the waste receptor section.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P182-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.3-P-STRAUSBAUGH.PMGCAC

P183 – 12
803.1

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

803.1 Waste water temperature. Steam pipes shall not directly connect ~~to any part of~~ to a drainage ~~or plumbing~~ system. Such pipes shall discharge into a waste receptor that is connected to the drainage system. ~~and~~ Water ~~above~~ having a temperature of 140°F (60°C) or greater shall not be discharged into ~~any part of~~ a drainage system. except where it is cooled to a temperature of less than 140°F (60°C) . ~~Such pipes shall discharge into an indirect waste receptor connected to the drainage system.~~

Reason: The existing language appears to be contradicting. The current text states that water greater than 140F must not discharge to a drainage system but the next line seems to say that it's OK if you dump it in a waste receptor first. This section was reworded to indicate that water temperatures of a 140°F or greater must be cooled to less than 140°F before being discharged to the drainage system

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Cost Impact: None

P183-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

803.1-P-STRAUSBAUGH.PMGCAC

P184 – 12
901.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

901.2 Trap seal protection. The plumbing system shall be provided with a system of vent piping that will permit the admission or emission of air so that the seal of any fixture trap shall not be subjected to a ~~pneumatic~~ pressure differential of more than 1 inch of water column (249 Pa).

Reason: The word "pneumatic" is unnecessary. Pressure is pressure whether its water or air pressure.
This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P184-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

901.2-P-STRAUSBAUGH.PMGCAC

P185 – 12
903.1

Proponent: Shawn Strausbaugh, representing the ICC PMG Code Action Committee

Revise as follows:

903.1 Roof extension. Open vent pipes that extend through a roof shall be terminated not less than [NUMBER] inches (mm) above the roof~~, except that~~. Where a roof is to be used for assembly or as a promenade, observation deck, sunbathing deck or similar purposes ~~for any purpose other than weather protection~~, ~~the~~ open vent pipes ~~extensions~~ shall terminate not less than 7 feet (2134 mm) above the roof.

Reason: The current language literally states that if a roof is to be used for anything other than weather protection, then vent pipes must be extended 7 feet above the roof. If there is equipment on the roof (HVAC units, grease duct fans, etc.), the roof is being used for another purpose, but, that is not the intent of the section. The intent of the section is that when the roof can be "normally occupied" such as where the roof is being used as an assembly area, a promenade, observation deck or sunbathing deck, that is when the vent pipes must be extended. The revised language makes the intent of the section more clear.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P185-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

903.1-P-STRAUSBAUGH.PMGCAC

P186 – 12
903.2

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

903.2 Frost closure. Where the 97.5-percent value for outside design temperature is 0°F (-18°C) or less, ~~every~~ vent extensions through a roof or wall shall be not less than 3 inches (76 mm) in diameter. Any increase in the size of the vent shall be made not less than 1 foot inside the ~~structure at a point not less than 1 foot (305 mm) below the roof or inside the wall~~ building's thermal envelope.

Reason: Requiring that the size transition occur at least 1 foot below the roof accomplishes nothing if it is just as cold below the roof as it is outdoors. The intent is to prevent frost blockage in the vent by making the part that is exposed to freezing temperatures at least 3 inches in diameter. The part of the vent that is less than 3 inches in size must be located in an area that stays above freezing. In most attics, the attic temperatures are very near the outdoor temperature , therefore, putting the size transition in the cold attic will subject the smaller pipe to freezing temperatures which is exactly what this section intended to avoid. The transition from a smaller size vent pipe to the 3 inch (or larger size) needs to occur at least one foot inside of the building's thermal envelope in order to avoid frost blockage.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P186-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

903.2-P-STRAUSBAUGH.PMGCAC

P187 – 12
904.1

Proponent: Tom Allen, City of Mt. Dora, representing self

Revise as follows:

904.1 Roof extension. ~~All open~~ Vent pipes that extend through a roof to terminate to the outdoors shall be terminated ~~at least~~ not less than ~~[NUMBER]~~ 6 inches (152 mm) above the roof. Where the roof is subject to ponding of storm water, vent pipes shall terminate not less than 2 inches (51 mm) above the highest elevation of ponded stormwater. ~~except that~~ Where a roof is to be used for any purpose other than weather protection, ~~the~~ vent pipes ~~extensions~~ shall ~~be run at least~~ extend not less than 7 feet (2134 mm) above the roof.

Reason: The code should state minimum height of the vent pipe above the roof as there are many jurisdictions that simply fail to fill in the [NUMBER] blank upon adoption. Where roofs are designed to pond storm water in case the primary roof drainage system is blocked, the vent pipe opening need to be above highest level of ponded water so that the storm water doesn't enter the plumbing vent systems and cause flooding in the building. The last sentence is changed to remove poor code language.

Cost Impact: There is not a cost impact.

P187-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

904.1-P-ALLEN

P188 – 12
904.3.1 (New)

Proponent: Bob Scott, Kye Lehr and Dennis Gardner - Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Add new text as follows:

<u>**904.3.1 Vent through metal roofs.** In climates where snow occurs, vent pipes passing through metal roofs shall be protected from loading caused by ice and snow sliding down the metal roof or the vent shall penetrate the roof within 4 feet of the roof peak. Protection methods and devices shall be approved by the code official.</u>

Reason: Protection of piping is presently limited to piping through walls, footers, and foundation. No mention of piping through the roof. Pipes that have been broken in the walls leak sewer gas or closed off. These vent pipes are difficult to repair once damaged in the wall or below the roof depending on location. We tried Steel and cast Iron pipe through the roof anchored them to framing members only to have the Ice and snow break the piping over inside the home causing structural damage by breaking through walls and knocking kitchen cabinets off the walls. Damaged vent pictures are available.

Cost Impact: Cost of approved material as required by local jurisdiction.

P188-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

904.3.1 (NEW)-P-SCOTT-LEHR-GARDNER

P189 – 12
915.1

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing InSinkErator (JBEngineer@aol.com)

Revise as follows:

915.1 Type of fixtures. A combination waste and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. Combination waste and vent systems shall not receive the discharge from a ~~food waste grinder or~~ clinical sink.

Reason: There is no technical justification for prohibiting a food waste grinder from discharging to a combination waste and vent system. A food waste grinder does not change the pressure in the piping system any differently than a sink operating without a food waste grinder. The food waste grinder will not impact the performance of the combination waste and vent system. A video was made showing the discharge from a food waste grinder. The video of the clear pipe shows the flow from a food waste grinder as being the same as the flow from the sink without a food waste grinder.

Cost Impact: This change does not increase the cost of construction.

P189-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

915.1-P-BALLANCO

P190 – 12
915.2.2

Proponent: Bob Scott and Daryl Kuiper, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

915.2.2 Connection. The combination waste and vent system shall be provided with a dry vent connected at any point within the system or the system shall connect to a horizontal drain that <u>serves vented fixtures located on the same floor.</u> ~~is vented in accordance with one of the venting methods specified in this chapter.~~ Combination waste and vent systems connecting to building drains receiving only the discharge from a <u>one or more</u> ~~stack or~~ stacks shall be provided with a dry vent. The vent connection to the combination waste and vent pipe shall extend vertically to a point not less than 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally. The horizontal length of a combination waste and vent system shall be unlimited.

Reason: The struck out phrase: "is vented in accordance with one of the venting methods specified in this chapter." is vague about how the horizontal drain needs to be vented. Does this mean that the horizontal drain serving a CWV system can be vented through a connection from a waste or soil stack that might extend many floors before exiting the roof? We believe that the intent of the code is for the horizontal drain to be vented by serving vented fixtures on the same floor as the CWV system is located. Depending upon venting air through waste flow in stacks might not provide consistent pressure conditions to keep from causing trap seal problems in the traps on a CWV system.

Cost Impact: None

P190-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

915.2.2-P-SCOTT-LEHR

P191 – 12
915.2.2

Proponent: Bob Scott, Kye Lehr and Dennis Gardner, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

915.2.2 Connection. The combination drain and vent system shall be provided with a dry vent connected at any point within the system ~~or be connected to a horizontal drain that is vented in accordance with one of the venting methods specified in the chapter.~~ Combination drain and vent systems connecting to building drains receiving only discharge from a *stack* or stacks shall be provided with a dry vent. The vent connection to the combination drain and vent pipe shall extend vertically a minimum of 6 inches (152mm) above the *flood level rim* of the highest fixture being vented before offsetting horizontally.

Reason: We have seen piping arrangements where the nearest vent connection on a horizontal drain line is over 100 feet away from the CWV system connection to the horizontal drain. If the horizontal drain is flowing at capacity (i.e. ½ full), is the air space above the flow line consistently adequate to provide sufficient venting air for the CWV system? This code section says it is but given the long horizontal drain lengths in large commercial buildings, we seriously doubt that there will be adequate venting for a CWV system. Our experience says that a dry vent for the CWV system should always be required. Depending on a vented horizontal drain in a one- or two-family dwelling where the drain lines are relatively short, should not be a problem. But in a large commercial building, the horizontal drain lines can be so lengthy that it is not wise to depend on such a line to provide venting air for a CWV system.

Cost Impact: Minimal cost impact.

P191-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

915.2.2-P-SCOTT-LEHR-GARDNER

P192– 12
918.5

Proponent: Shawn Strausbaugh, representing the ICC PMG Code Action Committee

Revise as follows:

918.5 Access and ventilation. Access shall be provided to all air admittance valves. ~~The~~ Such valves shall be installed in a loca~~ted~~tion ~~within a ventilated space~~ that allows air to enter the valve.

Reason: The question is frequently raised: "What constitutes a ventilated space?" The proposed language simply requires the AAVs to be located where air can enter the valve. For example, an AAV installed in wall cavity would require some means to allow air to enter the cavity.

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Cost Impact: None

P192-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

918.5-P-STRAUSBAUGH.PMGCAC

P193 – 12
1002.1

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan representing The Bureau of Construction Codes.

Revise as follows:

1002.1 Fixture traps. Each plumbing fixture shall be separately trapped by a liquid-seal trap, except as otherwise permitted by this code. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm), and the horizontal distance shall not exceed 30 inches (610 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.4. A fixture shall not be double trapped.

Exceptions:

1. This section shall not apply to fixtures with integral traps.
2. A combination plumbing fixture is permitted to be installed on one trap, provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart.
3. A grease interceptor intended to serve as a fixture trap in accordance with the manufacturer's installation instructions shall be permitted to serve as the trap for a single fixture or a combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the *developed length* of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm).
4. <u>Floor drains in multilevel parking structures that discharge to a building storm sewer shall not be required to be individually trapped.</u> Where floor drains in multilevel parking structures are required to discharge to a combined building sewer system, the floor drains shall not be required to be individually trapped provided that they are connect to a main trap in accordance with Section 1103.1.

Reason: This code change revision will improve the code by providing greater clarity. Sections 1002.1 and 1103.1 of the code currently address floor drains, leaders, and storm drains connected to combined building sewers. Storm water shall not discharge to sanitary sewers as stated in Section 1101.3. The absence of trap requirement instruction for floor drains connected to building storm sewer systems has been understood to not required traps for floor drains connected to storm sewers. The exceptions revision to the subject of floor drains in parking structures will provide a logical understanding of the subject.

Cost Impact: Construction cost will be reduced by providing greater understanding of proper floor drain application in building storm sewer use.

P193-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1002.1-P-KONYNDYK

P194 – 12
1002.3, Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Revise as follows:

1002.3 Prohibited traps. The following types of traps are prohibited:

1. Traps that depend on moving parts to maintain the seal.

   <u>**Exception:** In-line sanitary waste valves complying with ASME A112.18.8.</u>

2. Bell traps.
3. Crown-vented traps.
4. Traps not integral with a fixture and that depend on interior partitions for the seal, except those traps constructed of an *approved* material that is resistant to corrosion and degradation.
5. "S" traps.
6. Drum traps.

   Exception: Drum traps used as solids interceptors and drum traps serving chemical waste systems shall not be prohibited.

Add new standard to Chapter 14 as follows:

ASME
<u>A112.18.8–2009</u> <u>In-Line Sanitary Waste Valves for Plumbing Drainage</u>

Reason: In-Line sanitary waste valves are mechanical traps which have been tested and proven to maintain a gas tight seal when used in lieu of a normal p-trap. These valves are mainly used in manufactured homes in areas of small and limited confined spaces. The performance requirements for these valves are mentioned within the ASME A112.18.8 ANSI approved standard with a gas tight seal test.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.18.8–2009,with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P194-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1002.3-P-CONSTANTINO

P195 – 12

1002.4. 1002.4.1 (New), 1002.4.1.1 (New), 1002.4.1.2 (New), 1002.4.1.3 (New), 1002. 4.1.4 (New), Chapter 14

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing Sure Seal (JBEngineer@aol.com)

Revise as follows:

1002.4 Trap seals. Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. ~~Where a trap seal is subject to loss by evaporation, a trap seal primer valve shall be installed. Trap seal primer valves shall connect to the trap at a point above the level of the trap seal. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044.~~

1002.4.1 Trap seal protection. Traps seals of emergency floor drain traps and traps subject to evaporation shall be protected by one of the methods in Sections 1002.4.1.1 through 1002.4.1.4.

1002.4.1.1 Potable water supplied trap seal primer valve. A potable water supplied trap seal primer valve shall supply water to the trap. Water supplied trap seal primer valves shall conform to ASSE 1018. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap. Water supplied trap seal primer valves shall discharge not more than 8 gallons of water per year.

1002.4.1.2 Reclaimed or gray water supplied trap seal primer valve. A reclaimed or gray water supplied trap seal primer valve shall supply water to the trap. Water supplied trap seal primer valves shall conform to ASSE 1018. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap. The yearly discharge volume from reclaimed or gray water supplied trap seal primer valves shall not be limited.

1002.4.1.3 Waste water supplied trap primer device. A waste water supplied trap primer device shall supply water to the trap. Waste water supplied trap primer devices shall conform to ASSE 1044. The discharge pipe from the trap seal primer device shall connect to the trap above the trap seal on the inlet side of the trap.

1002.4.1.4 Barrier type trap seal protection device. A barrier-type trap seal protection device shall protect the floor drain trap seal from evaporation. Barrier type floor drain trap seal protection devices shall conform to ASSE 1072 and shall have an ASSE 1072 rating of AF-GW. The devices shall be installed in accordance with the manufacturer's instructions.

Add new standard to Chapter 14 as follows:

ASSE
1072-07 Performance Requirements for Barrier Type Floor Drain Tap Seal Protection Devices

Reason: This modification adds language to identify all of the methods available for protecting the trap seal of emergency floor drain traps or traps subject to evaporation. The four methods available are: water supplied trap seal primers, waste supplied trap primer devices, trap seal protection devices, and reclaimed water. A water supplied trap seal primer that is unrestricted can discharge 300 to 500 gallons a year to a trap. A 2" trap requires less than ½ gallon a year to maintain the trap seal. There are now devices available that limit the amount of water discharging to 8 gallons per year. The IPC currently has many water conservation measures. This is another water conservation measure.

Waste supplied trap primer devices divert water from a sink or lavatory to the trap. There is no need to limit the flow on these devices since they use waste water.

Trap seal protection devices do not require any water. They are tested for providing protection of the trap seal. By requiring a rating of AF-GW, all of the tests in ASSE 1072 become required. There were previous objections to not requiring all of the tests in the standard.

Reclaimed water can also be used to maintain the trap seal. Since the water is reclaimed, there is no need to limit the annual discharge.

Cost Impact: This change does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1072-07 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P_-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1002.4-P-BALLANCO

P196– 12
1002.4, Chapter 14

Proponent: David R. Scott, AIA, representing Target Corporation.

Revise as follows:

1002.4 Trap seals. Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, ~~a trap seal primer valve~~ one of the following shall be installed~~.~~: ~~Trap seal primer valves shall connect to the trap at a point above the level of the trap seal. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044.~~

1. A trap seal primer valve conforming to ASSE 1018 or ASSE 1044. The discharge pipe from a trap seal primer valve shall terminate at a point that is above the level of the trap seal.
2. Barrier type floor drain trap seal protection device complying with ASSE 1072.

Add new standard to Chapter 14 as follows:

ASSE
1072-2007 Performance requirements for Barrier Type Floor Drain Trap Seal Protection Devices

Reason: Some locations of floor drains and water source do not allow for proper trap seal primer valve installation. There is no easy way to verify if the trap seal primer valve has failed. A barrier-type device is much more accessible to verify proper operation and is easy to replace if needed. Water conservation measures make the barrier-type device more appealing as well.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1072-2007 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P196-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1002.4-P-SCOTT

P197 – 12
1002.6

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Revise as follows:

1002.6 Building traps. Building (house) traps shall be prohibited~~, except where local conditions necessitate such traps. Building traps shall be provided with a cleanout and a relief vent or fresh air intake on the inlet side of the trap. The size of the relief vent or fresh air intake shall not be less than onehalf the diameter of the drain to which the relief vent or air intake connects. Such relief vent or fresh air intake shall be carried above grade and shall be terminated in a screened outlet located outside the building~~.

Reason: The only remaining purpose identified for the installation of a building trap is to keep rats out of the building. However, super rats can swim through the building trap. Hence, the building trap serves no useful purpose. The problem with building traps is that they create a major obstruction to the flow of sewage. As a result, they often cause stoppages. Since the 1960's, it has been recognized that building traps should be eliminated. The code needs to recognize this by deleting the wording requested by certain major cities. These cities should eliminate their requirements for building traps since they are an obstruction to the flow.

Cost Impact: This change does not increase the cost of construction.

P197-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1002.6-P-BALLANCO

P198 – 12/13
1003.3 (New), 1003.3.2

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing InSinkErator (JBEngineer@aol.com)

Revise as follows:

<u>**1003.3 Grease interceptors required.** A grease interceptor shall be required to receive the drainage from fixtures and equipment with grease-laden waste from food service establishments, such as restaurants, hotel kitchens, bars, factory cafeterias or restaurants, school cafeterias, and clubs. The discharge from a food waste grinder shall not be classified as grease-laden waste and shall not discharge through a grease interceptor.</u>

~~**1003.3.2 Food waste grinders.** Where food waste grinders connect to grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste grinder. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste grinder.~~

(Renumber subsequent sections)

Reason: The legacy codes were much clearer in establishing when a grease interceptor is requirement. This text was extracted from the BOCA National Plumbing Code/1993. There are a few changes including the addition of "school cafeterias" to the list and the revision of the facilities to "food service establishments". The other change was the modification of the last sentence to state that the discharge from food waste grinders is not classified as grease laden waste, which was the intent of the legacy codes. The SBCCI Standard Plumbing Code had similar text. The current section 1003.1 and 1003.2 are very unclear as to when grease interceptors are necessary. This will assist the inspector with necessary language for mandating grease interceptors.

The deletion of Section 1003.3.2 will also clarify that food waste grinders are not permitted to discharge through a grease interceptor. This, again, was the intent of the legacy codes. A food waste grinder should never discharge through a grease interceptor. The purpose of a food waste grinder is to pulverize food waste to small enough particles to discharge to the sewer. If a grinder connects to a grease interceptor, the food particles will separate out, defeating the purpose of a food waste grinder. Similarly, if a food waste grinder discharges to a solids interceptor, the food particles will be separated.

Cost Impact: This change does not increase the cost of construction.

P198-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3 (NEW)-BALLANCO

P199 – 12
202, 1003.3.4, Chapter 14

Proponent: Rand H Ackroyd, Rand Technical Consulting LLC, representing Rand Technical consulting LLC (rackroyd@comcast.net)

Add new definition as follows:

GREASE INTERCEPTOR.

Fats, Oils, and Greases (FOG) disposal system. A plumbing appurtenance that reduces nonpetroleum fats, oils, and greases in effluent by separation or mass and volume reduction.

Revise as follows:

1003.3.4 Hydromechanical grease interceptors, fats, oils and greases disposal systems and automatic grease removal devices. *Hydromechanical grease interceptors; fats, oils, and greases disposal systems* and *automatic grease removal devices* shall be sized in accordance with ASME A112.14.3 ~~Appendix A~~, ASME 112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101. *Hydromechanical grease interceptors; fats, oils, and greases disposal systems* and *automatic grease removal devices* shall be designed and tested in accordance with ASME A112.14.3 ~~Appendix A~~, ASME 112.14.4, CSA B481.1, PDI G101 or PDI G102. Hydromechanical grease interceptors*; fats, oils, and greases disposal systems* and *automatic grease removal devices* shall be installed in accordance with the manufacturer's instructions. Where manufacturer's instructions are not provided, *hydromechanical grease interceptors; fats, oils, and greases disposal systems* and *automatic grease removal devices* shall be installed in compliance with ASME A112.14.3, ASME 112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101. ~~This section shall not apply to gravity grease interceptors.~~

Add new standard to Chapter 14 as follows:

ASME

A112.14.6-2010 FOG (Fats, Oils, and Greases) Disposal Systems

Reason: ASME A112.14.6 2010 FOG (Fats, Oils, and Greases) Disposal Systems is a National standard(ANSI) It covers performance requirements for both Hydro-mechanical Grease Interceptors and Gravity Grease interceptors. Appendix A is correct reference. New section proposed for Gravity Grease interceptors.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.14.6-2010 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P199-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3.4 – P-ACKROYD

P200– 12
202, 1003.3.6 (New), Chapter 14

Proponent: Rand H Ackroyd, Rand Technical Consulting LLC, representing Rand Technical Consulting LLC (rackroyd@comcast.net)

Add new definition to Chapter 2 as follows:

GREASE INTERCEPTORS.

Fats, Oils, and Greases (FOG) disposal systems. Plumbing appurtenances that reduce nonpetroleum fats, oils, and grease (FOG) in effluent by separation, mass and volume reduction.

Add new text as follows:

1003.3.6 Gravity grease interceptors and gravity grease interceptors with fats, oils, and greases disposal systems. The required capacity of *gravity grease interceptors* and *gravity grease interceptors* with *fats, oils, and greases disposal systems* shall be determined by multiplying the peak drain flow into the interceptor in gallons per minute by a retention time of 30 minutes. *Gravity grease interceptors* shall be designed and tested in accordance with IAPMO/ANSI Z100. *Gravity grease interceptors* with *fats, oils, and greases disposal systems* shall be designed and tested in accordance with ASME 112.14.6 and IAPMO/ANSI Z1001. *Gravity grease interceptors* and *gravity grease interceptors* with *fats, oils, and greases disposal systems* shall be installed in accordance with manufacturer's instructions. Where manufacturer's instructions are not provided, *gravity grease interceptors* and *gravity grease interceptors* with *fats, oils, and greases disposal systems* shall be installed in compliance with ASME A112.14.6 and IAPMO/ANSI Z1001.

Add new standards to Chapter 14 as follows:

ASME
A112.14.6-2010 FOG (Fats, Oils, and Greases) Disposal Systems

IAPMO
5001 East Philadelphia Street
Ontario, CA 91761

IAPMO
Z1001 -2007 Prefabricated Gravity Grease Interceptors

Reason: Gravity Grease Interceptors are defined in Chapter 2 and there is a National consensus standard IAPMO/ANSI Z1001-2007. ASME A112.14.6 2010 FOG (Fats, Oils, and Greases) Disposal Systems is a National standard(ANSI) It covers performance requirements for FOG Systems for both Hydro-mechanical Grease Interceptors and Gravity Grease interceptors

Cost Impact: None

Analysis: A review of the standards proposed for inclusion in the code, ASME A112.14.6-2010 and IAPMO Z1001-2007, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P200-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3.6 (NEW)-P-ACKROYD

P201 – 12
1003.3.6 (New), Chapter 14

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Add new text as follows:

1003.3.6 Fats, oils, and greases disposal systems. Fats, oils, greases disposal systems shall be designed and tested in accordance with ASME 112.14.6. Such systems shall be installed in accordance with manufacturer's instructions. Where manufacturer's instructions are not provided, such systems shall be installed in compliance with ASME A112.14.6.

Add new standard to Chapter 14 as follows:

ASME
A112.14.6–2010 FOG (Fats, Oils, and Greases) Disposal Systems

Reason: A FOG (Fats, Oils, and Greases) Disposal System is another type of grease removal device that needs to be included under Section 1003.3. The standard covers the performance requirements for these types of systems and requires that the effluent from such systems be not greater than 100 mg/L FOG as measured by USEPA Method 1664**.** ASME A112.14.16 is a National standard (ANSI).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.14.6-2010 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P201-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3.6 (NEW)-P-CONSTANTINO

P202 – 12
1003.3.6 (New)

Proponent: Shawn Strausbaugh, Arlington County VA representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Add new text as follows:

1003.3.6 Direct connection. The discharge piping from a grease interceptor shall be directly connected to the sanitary drainage system.

Reason: The contents found within a correctly functioning grease interceptor produce some of the foulest odors in the plumbing system. Many interceptors are typically located directly in the kitchen they serve where the food is being prepared for human consumption. It is not reasonable to have the outlet side of the grease interceptor open to atmosphere in any situation, yet some manufacturers do not prohibit such an arrangement in their installation instructions. Many designers want to extend indirect waste piping to a waste receptacle several feet away in lieu of providing a direct connect for shear convenience. In this situation they have added even more pungent surface area exposed to the interior environment in the food handling operation that serves the public. The code is a minimum standard and it should be minimally expected that grease storage odors should not be present in a restaurant setting.

Cost Impact: None

P202-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3.6 (NEW)-P-STRAUSBAUGH

P203 – 12

1003.3.6 (New), 1003.3.6.1 (New), 1003.3.6.2 (New), 1003.3.6.3 (New), Chapter 14

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

1003.3.6 Gravity grease interceptors. Gravity grease interceptors shall be water and gas tight. Interceptors shall be engineered to withstand the load to be placed on the interceptor such as from vehicular traffic. Interceptor capacity shall be not less than 750 gallons (2839 l). Gravity grease interceptors shall comply with IAPMO/ANSI Z1001.

1003.3.6.1 Grease capacity. The grease retention capacity of interceptors in pounds shall be not less than two times the flow-through rate. Grease interceptors for restaurants shall be sized in accordance with Equation 10-1. Grease interceptors for other establishments with commercial kitchens shall be sized in accordance with Equation 10-2. Where a grease interceptor discharges to a private sewage disposal system, the required capacity obtained by Equations 10-1 and 10-2 shall be increased 25 percent.

C = S ● GS ● (HR/12) ● LF ● 0.75 **(Equation 10-1)**

where:

C = Required capacity of grease interceptor in gallons

S = Number of seats in dining area

GS = Gallons of waste water per seat

where:

GS = 25 for restaurants with china dishes or automatic dishwasher
GS = 10 for restaurants with paper plates or baskets and without dishwasher

HR = Number of hours that restaurant is open

LF = Loading factor

where:

LF = 2.00 for interstate highway location
LF = 1.50 for other freeway location
LF = 1.25 recreational areas location
LF = 1.00 for main highway location
LF = 0.75 other highway location

For SI: 1 gallon = 3.8 liters

C = M ● GM ● LF x 0.75 **(Equation 10-2)**

where:

C = Required capacity of grease interceptor in gallons

M = Meals prepared per day

GM = Gallons of wastewater per meal

where:

GM = 5 for all applications

LF = Loading factor

where:

LF = 1.0 for presence of dishwashing machine
LF = 0.75 for without a dishwashing machine

For SI: 1 gallon = 3.8 liters

1003.3.6.2 Interceptor construction. Interceptors shall be prefabricated or field fabricated and shall have not less than one baffle that extends from the bottom of the interceptor to within 6 inches (152 mm)of the top of the interceptor. The baffles shall have an inverted long radius elbow fitting or other approved means equivalent in size to the inlet piping but in no case less than 4 inches (102 mm) in size installed in the inlet compartment side of the baffle with the fitting placed 12 inches (305 mm) above the bottom of the interceptor. The depth of the liquid shall be not less than 42 inches (1067 mm). Compartments shall be provided with access through an opening that is not less than 18 inches (457 mm) square or in diameter.

1003.3.6.3 Inlet and outlet piping. The inlet and outlet piping shall have a two way cleanout tee installed. Inlet piping shall enter at 2 ½ inches (64 mm) above the elevation of the invert of the outlet piping. Inlet piping shall extend to 24 inches (610 mm) below the water level. The outlet pipe shall start at 8 inches (203 mm) above the bottom of the interceptor and extend vertically to a tee. The tee and pipe shall be not less than 4 inches (102 mm) in diameter. The tee shall be installed with the run in the vertical orientation.

Add new standard to Chapter 14 as follows:

IAPMO
5001 East Philadelphia Street
Ontario, CA 91761

IAPMO
Z1001-2007 Prefabricated Gravity Grease Interceptors

Reason: To update the correct standard reference and to provide enforceable uniform criteria for sizing grease interceptors. The current code requires interceptors (for flows exceeding 100 gpm) but lacks enforceable code criteria for sizing interceptors. Similar language has been adopted within statewide codes for Florida and Massachusetts.
This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, IAPMO Z1001-2007, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P203-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3.6 (NEW)-P-STRAUSBAUGH.PMGCAC

P204 – 12
1003.4

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan representing The Bureau of Construction Codes. (konyndykr@michigan.gov)

Revise as follows:

1003.4 Oil separators required. At repair garages, car washing facilities, at factories where oily and flammable liquid wastes are produced and in hydraulic elevator pits, separators shall be installed into which all oil-bearing, grease bearing or flammable wastes shall be discharged before emptying into building drainage system or other point of disposal.

> **Exception:** An oil separator is not required in hydraulic elevator pits where an *approved* alarm system is installed<u>. Such alarm systems shall not terminate the operation of pumps utilized to maintain emergency operation of the elevator by firefighters.</u>

Reason: This code change revision will improve the code by addressing life safety issues. Adoption of the American Society of Mechanical Engineers (ASME) A17.1 Edition 2007, Safety Code for Elevators and Escalators, 2.2.2.5, requires elevators for Firefighters Emergency Operation to have a drain or pump capacity to remove 50 gallons per minute. The removal capacity provides consideration for fire suppression discharges. The consideration is to assure elevator operations for life safety matters by having identified discharge capacities and operations. The IPC Commentary discussion mistakenly only considers the subsoil water presence for drainage. This proposed revision assures that approved alarm systems shall not stop the pump operation. The approval should be centered upon an alarm visual and audio notification to the building operator of oil or water presence.

Cost Impact: Construction cost will not be affected by this life safety matter.

P204-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.4-P-KONYNDYK

P205 – 12
1003.4

Proponent: Andy Neuman, Assistant Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan representing The Bureau of Construction Codes.(konyndykr@michigan.gov)

Revise as follows:

1003.4 Oil separators required. At repair garages, car washing facilities, <u>and</u> at factories where oily and flammable liquid wastes are produced ~~and in hydraulic elevator pits,~~ separators shall be installed into which all oil-bearing, grease bearing or flammable wastes shall be discharged before emptying into building drainage system or other point of disposal.

> ~~**Exception:** An oil separator is not required in hydraulic elevator pits where an approved alarm system is installed~~.

Reason: This code change revision will improve the code by correcting overly restrictive text which is addressed by practical elevator preventive maintenance. Adoption of the American Society of Mechanical Engineers (ASME) A17.1 Edition 2007, Safety Code for Elevators and Escalators, 2.2.2.5, requires elevators for Firefighters Emergency Operation to have a drain or pump capacity to remove 50 gallons per minute. The removal capacity provides consideration for fire suppression discharges. The consideration assures elevator operations for life safety matters by having identified discharge capacities and operations.

The IPC Commentary discussion mistakenly only considers the subsoil water presence for drainage. Elevator pits are designed to allow a very minimal amount of subsoil water if any. Additionally elevator pits are generally required to be inspected which would identify the presence of hydraulic fluid. Requiring oil separators for an emergency fire sprinkler discharge is impractical. Further the sizing of an oil separator in this case is not clarified by code. Is it sized by potential amounts? Who can predict the number of head discharges? Is it sized by the floor area per Section 1003.4.2.2? That floor area could be the pit area only or the entire floor area divided by the number of serving elevators.

This proposed revision mirrors concerns expressed by the design community and welcomes any sizing clarification from hearing attendees.

Cost Impact: Construction cost will be reduced by the proposed revision.

P205-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.4-P-NEUMAN

P206 – 12
1003.4

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

1003.4 Oil separators required. At repair garages <u>where floor or trench drains are provided</u>, carwashing facilities, ~~at~~ factories where oily and flammable liquid wastes are produced and ~~in~~ hydraulic elevator pits, <u>oil</u> separators shall be installed into which ~~all~~ oil-bearing, greasebearing or flammable wastes shall be discharged before emptying into the building drainage system or other point of disposal.

> **Exception:** An oil separator is not required in a hydraulic elevator pit where an approved alarm system is installed.

Reason: The current text appears to assume that repair garages have floor drains, trench drains or some drains into which oily wastes are being discharged. If a repair garage has no such drains, what is the purpose of an oil separator? The requirement for a separator should be triggered by the presence of fixtures that are a source of oily waste. A repair garage with only a toilet facility has no need for a separator.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P206-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.4-P-STRAUSBAUGH.PMGCAC

P207 – 12
1003.6

Proponent: Jim Kendzel, MPH, CAE, Executive Director/CEO American Society of Plumbing Engineers (ASPE) representing himself (jkendzel@aspe.org)

Revise as follows:

1003.6 ~~Laundries~~ Clothes washer discharge interceptor. ~~Laundry facilities not installed within an individual dwelling unit or intended for individual family use~~ Clothes washers shall discharge through an interceptor that is provided with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½ inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewage system.

Exceptions:

1. Clothes washers in individual dwelling units shall not be required to discharge through an interceptor.
2. A single clothes washer designed for use in individual dwelling units and installed in a location other than an individual dwelling unit shall not be required to discharge through an interceptor.

Reason: The phrase "intended for individual family use" is vague and seems to indicate that a roomful of residential type clothes washing machines in an apartment complex would not require an interceptor. This application is no different from a standalone laundry facility that has multiple residential type clothes washers that would, logically, need an interceptor. The first exception already exists in current code text. The second exception is for the small business establishments such as hair salons, small restaurants, and small apartment buildings where only one dwelling unit-type machine is installed as such use is typically no worse than a family use of the single machine.

Cost Impact: The code change proposal will not increase the cost of construction.

P207-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.6-P-KENDZEL

P208 – 12
1003.9

Proponent: Shawn Strausbaugh, Arlington County VA, representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region (Sstrausbaugh@arlingtonva.us)

Revise as follows:

1003.9 Venting of interceptors and separators. Interceptors and separators shall be designed so as not to become air bound. ~~where tight covers are utilized. Each~~ Interceptors ~~or~~ and separators shall be vented in accordance with one of the methods of Chapter 9. ~~where subject to a loss of trap seal.~~

Reason: Where subject to a "loss of trap seal." is inaccurate terminology for this application. In many instances we are referring to a tank or large sump that contains a body of water which is not actually a "trap seal" but rather a storage area for some type of contained debris. Venting methods located in Chapter 9 are provided to prevent the occurrence of siphonage and eliminate the potential for a piping system to be subject to a pressure differential of more than 1 inch of water column.

Cost Impact: None

P208-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.9-P-STRAUSBAUGH

P209 – 12
202, 1101.2

Proponent: Karen Hobbs, Natural Resources Defense Council, representing herself (khobbs@nrdc.org); Eddie Van Giesen, BRAE Rainwater Technologies, representing himself (vangig@watts.com); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Add new definitions as follows:

RAINWATER: Precipitation on any public or private parcel that has not entered an offsite storm drain system or channel, a flood control channel, or any other stream channel, and has not previously been put to beneficial use.

RAINWATER CAPTURE SYSTEM: A system designed to capture and store rainwater flowing off of a building, parking lot, or any other manmade, impervious surface for the purposes of using the rainwater for beneficial onsite use.

STORMWATER. Precipitation that has contacted a surface at grade or below grade and has not been put to beneficial use.

Revise as follows:

1101.2 Where required. *Rainwater* from ~~all~~ roofs, paved areas, yards, courts and courtyards shall drain onto open, unpaved areas for infiltration or evapotranspiration where such drainage will not cause or contribute to health, geotechnical or other hazards; or rainwater shall drain to a *rainwater capture system*. Where drainage onto open unpaved areas is not possible and a *rainwater capture system* would not provide beneficial use for the building, *rainwater* from ~~all~~ roofs, paved areas, yards, courts and courtyards shall drain into a separate storm *sewer* system, a combined *sewer* system or to an *approved* place of discharge. ~~For one- and two-family dwellings, and where approved,~~ *Storm water* is permitted to discharge onto flat areas, such as streets or lawns, provided that the storm water flows away from the building.

Reason:

1. The costs to repair and replace our nation's aging water infrastructure are enormous, with investment needs of $298 billion or more over the next 20 years, according to the U.S. Environmental Protection Agency (USEPA, 2008; http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf). In 2009, the American Society of Civil Engineers gave the nation's wastewater facilities a grade of D-minus due to their condition (American Society of Civil Engineers, 2009; http://www.infrastructurereportcard.org/sites/default/files/RC2009_full_report.pdf).
2. As NRDC recently documented in its "Rooftops to Rivers II" report (available at http://www.nrdc.org/water/pollution/rooftopsii/files/rooftopstoriversII.pdf), many cities recognize the unnecessary stress to their wastewater systems caused by having roofs and other paved areas draining directly into the sewer system, when other options exist, such as having those same surfaces drain to open, unpaved areas or captured for reuse through a rainwater harvesting system. Cities often require that roofs and paved areas drain into open, unpaved areas where the rainwater can either be infiltrated into the ground, evapotranspirated, or captured for later reuse. Many cities also have mandatory downspout disconnection programs for existing construction and many are considering mandatory downspout disconnections for new construction.
3. There are also a range of benefits that communities accrue when rainwater is either captured or reused. In a study conducted by NRDC and the University of California, Santa Barbara, *A Clear Blue Future (*http://www.nrdc.org/water/lid) found that implementing practices that emphasize on-site infiltration or capture and reuse had the potential to increase local water supplies by up to 405,000 acre-feet per year by 2030 at new and redeveloped residential and commercial properties in Southern California and the San Francisco Bay area. This represents roughly two-thirds of the volume of water used by the entire city of Los Angeles each year. These water savings translate into electricity savings of up to 1,225,500 megawatt-hours—which would decrease the release of carbon dioxide (CO_2) into the atmosphere by as much as 535,500 metric tons per year—because more plentiful local water reduces the need for energy-intensive imported water. And, perhaps most importantly, these benefits would increase every year.

Cost Impact: There is no cost impact to this proposal.

P209-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.2-P-HOBBS

P210 – 12
1101.3

Proponent: Bob Scott and Kye Lehr-Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Revise as follows:

1101.3 Prohibited Drainage. Storm water shall not be drained into sewers only intended for sewage. <u>Storm water shall not discharge onto public walkways.</u>

Reason: Storm water can cause a slip hazard when pooled on walkways. This is especially true in climates where freezing is possible.

Cost Impact: None. The practice of locating storm terminations at approved locations in decided at the design phase.

P210-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.3-P-SCOTT-LEHR

P211 – 12
1101.7

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self (JBEngineer@aol.com)

Revise as follows:

1101.7 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked. <u>The maximum possible depth of water on the roof shall include the height of the water required above the inlet of the secondary roof drainage means to achieve the required flow rate of the secondary drainage means to accommodate the design rainfall rate as required by Section 1106.</u>

Reason: Quite often, structural engineers are using the lower edge of a secondary roof drain to be the determining factor for establishing the maximum depth of water that can pond on the roof. However, the drain requires a certain head height to achieve a particular flow rate. That additional head height of water adds to the structural load. This change merely clarifies the intent of the current requirement. This change is consistent with the load requirements in the Building Code.

Cost Impact: This change does not increase the cost of construction.

P211-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.7-P-BALLANCO

P212 – 12
1101.8 (New)

Proponent: Bob Scott, Kye Lehr and Dennis Gardner, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Add new text as follows:

<u>**1101.8 Heated roof drain discharge termination required.** Where the 97.5-percent value for the outdoor design temperature is 0°F (-18°C) or less and the primary roof drain system discharges to a location exposed to such temperature, the piping at the discharge location shall be heated to prevent water freezing and blocking the outlet.</u>

(Renumber subsequent sections)

Reason: In cold climate areas the roof drains will freeze shut at the outlet causing a backup of Ice in the roof drain causing the Ice and water to build up on the roof and in the drain. The problem then is the roof drain freezes solid breaking the pipe causing damage not only to the pipe but to the inside of the building as it thaws and causes an unnecessary buildup of ice and water on the roof causing even more damage when it thaws.

Cost Impact: Low compared to the cost of repair for not making the change to the code.

P212-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.8-P-SCOTT-LEHR-GARDNER

P213 – 12
1101.10 (New)

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute representing self (blevan@mindspring.com)

Add new text as follows:

1101.10 Inspections. Where storm drainage piping penetrates a fire resistance rated wall, a fire resistant rated floor or a fire resistant rated ceiling, the piping shall be inspected before and after the installation of fire stopping material to verify that the piping system has not been modified.

Reason: This change is proposed to assure that the installation of the piping is not altered during the installation of fire stopping materials.

Cost Impact: The code change proposal will not increase the cost of construction

P213-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.10 (NEW)-P-LEVAN

P214 – 12
Table 1102.5

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

TABLE 1102.5
SUBSOIL DRAIN PIPE

MATERIAL	STANDARD
Polyvinyl chloride (PVC) Plastic pipe (type sewer pipe, SDR 35 PS25, PS50 or PS100)	ASTM D 2729; ASTM D 3034; ASTM F 891; CSA B182.2; CSA B182.4

(Portions of table not shown remain unchanged)

Reason: This type of pipe material is readily available in perforated form and should be allowed to be used in the application.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

P214-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1102.5-P-STRAUSBAUGH.PMGCAC

P215 – 12
1102.8 (New)

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute representing self (blevan@mindspring.com)

Add new text as follows:

1102.8 Cast iron soil pipe, fittings and mechanical joint hubless couplings. Upon request by the code official, certificates of conformance shall be provided by the manufacturer to the code official indicating that cast iron pipe, cast iron fittings and mechanical joint hubless couplings are in compliance with Sections 705 and 1102.

Reason: This will ensure the purchaser and/or owner meet or exceed the requirements of the code and manufacturer requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

P215-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1102.8 (NEW)-P-LEVAN

P216 – 12
1103.1

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan representing The Bureau of Construction Codes (konyndykr@michigan.gov)

Revise as follows:

1103.1 Main trap. Leaders and storm drains connected to a combined sewer shall be trapped. Individual storm water traps shall be installed on the storm water drain *branch* serving each conductor, or a single trap shall be installed in the main *storm drain* just before its connection with the combined *building sewer* or the *public sewer*. <u>Leaders and storm drains connected to a building storm sewer shall not be required to be trapped.</u>

Reason: This code change revision will improve the code by providing greater clarity. Sections 1002.1 and 1103.1 of the code currently address floor drains, leaders, and storm drains connected to combined building sewers. Storm water shall not discharge to sanitary sewers as stated in Section 1101.3. The absence of trap requirement instruction for leader/conductors and storm drains connections to building storm sewer systems has been understood to not require traps to storm sewers. The IPC Commentary for Section 1103.1 states: “Unlike a sanitary system, a storm drainage system is not designed for any precautions against sewer gas.”

This last sentence clarification will provide a logical understanding of the subject. Further it is my understanding that text addressing the overall subject matter is preferred to be within the section body rather than using an exception.

Cost Impact: Construction cost will be reduced by providing greater understanding of proper trap requirements when building storm sewers are utilized.

P216-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1103.1-P-KONYNDYK

P217– 12
1104.2

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Delete without substitution:

~~**1104.2 Combining storm with sanitary drainage.** The sanitary and storm drainage systems of a structure shall be entirely separate except where combined *sewer* systems are utilized. Where a combined *sewer* is utilized, the building *storm drain* shall be connected in the same horizontal plane through a single-wye fitting to the combined *sewer* not less than 10 feet (3048 mm) downstream from any soil *stack*.~~

Reason: The section on combined sanitary and storm systems implies that the two systems are combined inside the building. A companion code change will require the connection to be independent to the public sewer. This allows the separation of systems when separate sewer systems are added in the future to the public system.

Cost Impact: This change does not increase the cost of construction.

P217-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.2-P-BALLANCO

P218 – 12
1105.2 (New)

Proponent: Julius Ballanco, P.E., CPD, FASPE, JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Add new text as follows:

1105.2 Roof drain flow rate. The published roof drain flow rate based upon the head of water above the roof drain shall be used to size the storm drainage system in accordance with Section 1106. The flow rate used for sizing the storm drainage piping shall be based on the maximum anticipated ponding at the roof drain.

(Renumber subsequent sections)

Reason: The code currently requires the storm drainage system to be sized based on the roof area. The sizing never considered the flow rate through a roof drain, nor the ponding around the roof drain required to achieve that flow rate. A study by the ASPE Research Foundation discovered that the flow rates through roof drain vary based on the design of the roof drain. The study also found that for certain roof drains, there were different flow rates depending on which strainer was installed. As a result, some smaller drains are allowing more water through the drain than the pipe is designed to handle under open channel flow.

The only proper way to size a storm drainage system is to apply the known flow rates through the roof drain such that the piping is properly sized. Without knowledge of the flow rate through a roof drain, a storm drainage system can be either undersized or oversized.

Cost Impact: This change will increase the cost of construction.

P218-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1105.2 (NEW)-P-BALLANCO

P219 – 12

1106.2, Table 1106.2 (New), Table 1106.2(1), Table 1106.2(2), 1106.3, Table 1106.3 (New), 1106.6, Table 1106.6

Proponent: Julius Ballanco, P.E., CPD, FASPE, JB Engineering and Code Consulting, P.C. representing himself (JBEngineer@aol.com)

Revise as follows:

~~**1106.2 Vertical conductors and leaders.** Vertical conductors and leaders shall be sized for the maximum projected roof area, in accordance with Table 1106.2(1) and Table 1106.2(2).~~

~~TABLE 1106.2(1)~~
~~SIZE OF CIRCULAR VERTICAL CONDUCTORS AND LEADERS~~

~~TABLE 1106.2(2)~~
~~SIZE OF RECTANGULAR VERTICAL CONDUCTORS AND LEADERS~~

~~**1106.3 Building storm drains and sewers.** The size of the building *storm drain*, building storm *sewer* and their horizontal branches having a slope of one-half unit or less vertical in 12 units horizontal (4-percent slope) shall be based on the maximum projected roof area in accordance with Table 1106.3. The slope of horizontal branches shall be not less than one-eighth unit vertical in 12 units horizontal (1-percent slope) unless otherwise *approved*.~~

~~TABLE 1106.3~~
~~SIZE OF HORIZONTAL STORM DRAINGE PIPING~~

1106.2 Size of storm drain piping. Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. The flow rate in storm drain piping shall not exceed that specified in Table 1106.2.

TABLE 1106.2
STORM DRAIN PIPE SIZING

PIPE SIZE (inches)	CAPACITY (gpm)				
	VERTICAL DRAIN	SLOPE OF HORIZONTAL DRAIN			
		1/16 inch per ft	1/8 inch per ft	¼ inch per ft	½ inch per ft
2	34	15	22	31	44
3	87	39	55	79	111
4	180	81	115	163	231
5	311	117	165	234	331
6	538	243	344	487	689
8	1,117	505	714	1,010	1,429
10	2,050	927	1,311	1,855	2,623
12	3,272	1,480	2,093	2,960	4,187
15	5,543	2,508	3,546	5,016	7,093

1106.3 Vertical leader sizing. Vertical leaders shall be sized based on the flow rate from horizontal gutters or the maximum flow rate through roof drains. The flow rate through vertical leaders shall not exceed that specified in Table 1106.3.

TABLE 1106.3
VERTICAL LEADER SIZING

SIZE OF LEADER (inches)	CAPACITY (gpm)
2	30
2 × 2	30
1½ × 2½	30
2½	54
2½ × 2½	54
3	92
2 × 4	92
2½×3	92
4	192
3 × 4¼	192
3½×4	192
5	360
4 × 5	360
4½ × 4½	360
6	563
5 × 6	563
5½ × 5½	563
8	1208
6 × 8	1208

1106.6 Size of roof gutters. ~~The size of semicircular gutters shall be based on the maximum projected roof area in accordance with Table 1106.6.~~ Horizontal gutters shall be sized based on the flow rate from the roof surface. The flow rate in horizontal gutters shall not exceed that specified in Table 1106.6.

~~**TABLE 1106.6**~~
~~**SIZE OF SEMICIRCULAR ROOF GUTTERS**~~

TABLE 1106.6
HORIZONTAL GUTTER SIZING

GUTTER DIMENSIONS[a] (inches)	SLOPE (inch/foot)	CAPACITY (gpm)
1½ × 2½	1/4	26
1½ × 2½	1/2	40
4	1/8	39
2¼ × 3	1/4	55
2¼ × 3	1/2	87
5	1/8	74

4 × 2½	1/4	106
3 × 3½	1/2	156
6	1/8	110
3 × 5	1/4	157
3 × 5	1/2	225
8	1/16	172
8	1/8	247
4½ × 6	1/4	348
4½ × 6	1/2	494
10	1/16	331
10	1/8	472
5 × 8	1/4	651
4 × 10	1/2	1055

a. Dimensions are width by depth for rectangular shapes.
Single dimensions are diameters of a semicircle.

Reason: The ASPE Research Foundation completed a research project on the flow rates through roof drains. What was uncovered was the fact that storm drainage systems have been improperly designed since the code requirements inception. The code requirements date back to the original National Plumbing Code recommendations from the National Bureau of Standards published in 1940. The current code assumes that the water will gradually flow to a roof drain and flow into the piping, never to exceed the amount of flow permitted in the drain.

What is occurring is the rain water flows at different rates depending on the pitch of the roof. The more ponding of water at the roof drain, the greater the quantity of flow through the roof drain. The research discovered that for smaller roof drains, the roof drain often allowed a much greater quantity of water to flow in the drain than is permitted by pipe sizing. The end result is the storm drain becomes a pressurized piping system. There are many occurrences of pipe failures resulting from storm drainage piping blowing apart inside the building. This can be attributed to improper sizing of the storm drainage system. Either a smaller roof drain was required, or a larger storm drain pipe.

By changing the method of sizing, the flow through the roof drain is finally considered when sizing the piping system. This is no different than sizing a sanitary drainage system whereby the system is sized based on the flow rate from a given fixture drain.

There is no need to indicate roof areas since the slope and shape of the roof will impact the sizing of the storm drainage system. An engineer will have to evaluate the amount of ponding around the roof drain during a 100 year storm of one hour duration. Once the ponding is known, the drain can be selected based on the flow rate of that particular drain. The piping is then sized based on the flow through the roof drain.

The sizing for all of the tables was taken from the ASPE Sizing Tables Application. Schedule 40 PVC was used for the pipe sizes, with the exception of 5 inch. Cast iron was used to develop the 5 inch numbers. The flow rates are maximum flows using one third full for the stacks and full flow for the horizontal drains. One third full stacks was identified by the National Bureau of Standards as a flow amount that will assure open channel flow in the piping system.

Gutter sizing was also taken from the ASPE Sizing Table Application.

The ASPE Research Foundation report has not been published as of the date of code change submittal deadline. However, the testing has been completed. The flow rate through roof drains varies with manufacturer, type of strainer, and head height. There is no one size fits all result from the testing. An engineer must know the flow through the roof drain they select in order to properly size the system.

Cost Impact: This change will increase the cost of construction.

P219-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1106.2-P-BALLANCO

P220 – 12
1108.1

Proponent: Bob Adkins, Prince William County VA Representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (radkins@pwcgov.org)

Revise as follows:

1108.1 Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. <u>Where primary and secondary roof drains are manufactured as a single assembly, the inlet and outlet for each drain shall be independent.</u>

Reason: Fittings are available today to accomplish a single roof penetration and provide both a primary drain and a secondary roof drain. This added text will assure compliance is met with Section 1108.2 to maintain separate primary and secondary systems.

Cost Impact: None

P220-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1108.1-P-ADKINS

P221 – 12
1108.3

Proponent: Julius Ballanco, P.E., CPD, FASPE, JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Revise as follows:

1108.3 Sizing of secondary drains. Secondary (emergency) roof drain systems shall be sized in accordance with Section 1106 based on the rainfall rate for which the primary system is sized ~~in Tables 1106.2(1), 1106.2(2), 1106.3 and 1106.6~~. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall have an opening dimension of not less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

Reason: This is a companion change to the change to Section 1106. There is no need to reference the tables in Section 1106. By merely referencing the section, the code adequately identifies the requirements for sizing the secondary drainage system.

P221-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1108.3-P-BALLANCO

P222 – 12
1110, 1110.1

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Delete without substitution:

~~**SECTION 1110**~~
~~**VALUES FOR CONTINUOUS FLOW**~~

~~**1110.1 Equivalent roof area.** Where there is a continuous or semicontinuous discharge into the building *storm rain* or building storm *sewer*, such as from a pump, ejector, air conditioning plant or similar device, each gallon per minute (L/m) of such discharge shall be computed as being equivalent to 96 square feet (9 m2) of roof area, based on a rainfall rate of 1 inch (25.4 mm) per hour.~~

Reason: This is a companion change to the change in sizing in Section 1106. Since the new sizing method uses gpm for sizing, there is no need to convert numbers for adding values for continuous flow. The gpm is simply added to the rainfall gpm.

Cost Impact: This change does not increase the cost of construction.

P222-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1110-P-BALLANCO

P223– 12
1302.2, Chapter 14

Proponent: Jeremy Brown, NSF International (Jeremy@nsf.org)

Revise as follows:

1302.2 Disinfection and treatment. ~~Gray water shall be disinfected by an approved method that employs one or more disinfectants such as chlorine, iodine or ozone that are recommended for use with the pipes, fittings and equipment by the manufacturer of the pipes, fittings and equipment.~~ Gray water shall be disinfected and treated by an on-site water reuse treatment system complying with NSF 350.

Add new standard to Chapter 14 as follows:

NSF
350-2011 Onsite Residential and Commercial Water Reuse Treatment Systems

Reason: In addition to microbiological contaminants that need disinfection, gray water contains organic compounds, suspended solids, turbidity, surfactants, and other contaminants that have the potential to accumulate and negatively impact the functioning of water closets and urinals if not treated properly. NSF/ANSI-350 *Onsite Residential and Commercial Water Reuse Treatment Systems* establishes the minimum materials, design and construction, and performance requirements for systems that disinfect and treat gray water for non-potable reuse applications, including flushing water for closets and urinals. Rigorous testing with gray water as defined by the standard ensures the treatment systems meet strict effluent quality requirements suitable for reuse applications, along with providing protection of public health and the environment. NSF 350 is currently referenced in the IGCC and IAPMO Green Supplement. Copies of this document may be obtained from the proponent.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NSF 350-2011, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P223-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1302.2-P-BROWN

P224 – 12
1302.4

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Revise as follows:

~~**1302.4 Coloring.** The gray water shall be dyed blue or green with a food grade vegetable dye before such water is supplied to the fixtures.~~

Reason: This is an archaic requirement that dates back to when gray water was first considered for flushing water closets and urinals. The reason for abandoning the practice was because the dye stained building components when there was splashing of the dyed gray water. The means of identifying gray water is the purple coloring of the piping system.

Cost Impact: This change does not increase the cost of construction.

P224-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1302.4-P-BALLANCO

P225_ – 12
1308.1.1 (New), Chapter 14

Proponent: Lorri Grainawi, STI/SPFA Representing the Steel Tank Institute / Steel Plate Fabricators Association (lgrainawi@steeltank.com)

Add new text as follows:

1308.1.1 Design and construction. Reservoirs shall be designed and constructed in accordance with Chapters 16 through 22 of the International Building Code and in accordance with the following standards as appropriate for the material of the reservoir: AWWA D100, AWWA D115, AWWA D120, UL 58, UL 1746, UL 1316, UL 142, API 12F or API 12D.

Add new standards to Chapter 14 as follows:

American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

API

API 12F-2008	Specification for Shop Welded Tanks for Storage of Production Liquids, effective April 1, 2009
API 12D-2008	Specification for Field Welded Tanks for Storage of Production Liquids, effective April 1, 2009

AWWA

D100-05	AWWA Standard for Welded Carbon Steel Tanks for Water Storage
D115-06	AWWA Standard for Tendon Prestressed-Concrete Water Tanks
D120-09	AWWA Standard for Thermosetting Fiberglass-Reinforced Plastic Tanks

UL

UL 58-1996	Steel Underground Tanks for Flammable and Combustible Liquids with revisions through July 27, 1998
UL 1746-2007	External Corrosion Protection Systems for Steel Underground Storage Tanks
UL 1316-1994	Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol Gasoline Mixtures with revisions through May 12, 2006
UL 142-2006	Steel Aboveground Tanks for Flammable and Combustible Liquids with revisions through February 12, 2010

Reason: The Steel Tank Institute is proposing the above language in response to the fact that there are no specific references to allow the designer the ability to directly reference the appropriate provisions for the design and construction of reservoirs.

In addition, we would note that the graywater and rainwater reservoir market today is unregulated. We have experienced this through the number of communications to the Institute, were it has been found that the inquiries were citing an inconsistent application for the design and construction of reservoirs.

Our position is that some form of structural provisions needs to be incorporated in order to ensure that this subject is, at the very least, addressed. These provisions are not intended, nor do they, favor one or more materials or types of constructions of reservoirs. We simply feel that basic structural and foundation provisions of the International Building Code should be used to provide for the safe storage and installation of reservoirs holding gray water and rainwater.

With respect to the listing of standards, STI has simply employed those standards used in other applications, such as automatic fire suppression reservoirs and fuel tank reservoirs. Unfortunately, until either these standards are enhanced, or new standards are created, to handle gray water and rain water applications we felt these the most appropriate since they do cover the structural design of a reservoir.

Cost Impact: We do not anticipate significant additional costs.

Analysis: A review of the standards proposed for inclusion in the code, API 12F-2008, API 12D-2008, AWWA D100-05, AWWA D115-06, AWWA D120-09, UL 58-1996, UL 1746-2007, UL 1316-1994 and UL 142-2006, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P225-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1308.1.1-P-GRAINAWI

P226 – 12
Table E202.1

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (mike@cmservnet.com)

Revise as follows:

TABLE E202.1
INTERNAL VOLUME OF VARIOUS WATER DISTRIBUTION TUBING

OUNCES OF WATER PER FOOT OF TUBE									
Size Nominal, Inch	**Copper Type M**	**Copper Type L**	**Copper Type K**	**CPVC CTS SDR 11**	**CPVC SCH 40**	**<u>CPVC SCH 80</u>**	**<u>PE-RT SDR 9</u>**	**Composite ASTM F 1281**	**PEX CTS SDR 9**
3/8”	1.06	0.97	0.84	N/A	1.17	<u>-</u>	<u>0.64</u>	0.63	0.64
1/2”	1.69	1.55	1.45	1.25	1.89	<u>1.46</u>	<u>1.18</u>	1.31	1.18
3/4”	3.43	3.22	2.90	2.67	3.38	<u>2.74</u>	<u>2.35</u>	3.39	2.35
1”	5.81	5.49	5.17	4.43	5.53	<u>4.57</u>	<u>3.91</u>	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	<u>8.24</u>	<u>5.81</u>	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	<u>11.38</u>	<u>8.09</u>	13.88	8.09
2”	21.08	20.58	20.04	15.79	21.88	<u>19.11</u>	<u>13.86</u>	21.48	13.86

For SI: 1 ounces = 0.030 liter

Reason: This proposal simply adds two more commonly used water distribution piping and tubing materials to this table in order to make the table more useful to designers.

Cost Impact: None

P226-11

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

TE202.1-P-CUDAHY

P227 – 12
Table E202.1

Proponent: Larry Gill, P.Eng. IPEX USA LLC (larry.gill@ipexna.com)

Revise as follows:

TABLE E202.1
INTERNAL VOLUME OF VARIOUS WATER DISTRIBUTION PIPING

OUNCES OF WATER PER FOOT OF TUBE							
Size Nominal Inch	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	Composite ASTM F 1281	PEX CTS SDR 9, <u>PE-RT SDR 9</u>

(Portions of table not shown remain unchanged.)

Reason: Revise the table to include polyethylene of raised temperature (PE-RT) (same dimensions as PEX). All dimensions in the table remain unchanged.

Cost Impact: The proposed change will not increase the cost of construction

P227-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

TE202.1-P-GILL

P228 – 12
202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC STRUCTURAL DEVELOPMENT COMMITTEE.

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

Revise as follows:

[B] DESIGN FLOOD ELEVATION. The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard map. In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building’s* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

Reason: This definition is controlled by the IBC; this proposal brings the IPC, IMC, IFGC, and IPSDC definitions in line with the term as defined by the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

P228-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-PSD-DESIGN FLOOD ELEVATION-INGARGIOLA-WILSON-QUINN.doc

P229 – 12
505.8.2

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting representing The Copper Development Association (penniefeehan@me.com)

Revise as follows:

505.8.2 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ The ends of pipe or tub~~e~~ing shall be cut square and shall be reamed to the full inside diameter of the pipe or tub~~e~~ing. ~~end.~~ Burrs on the outside end of the pipe or tubing shall be removed. ~~All~~ Joint surfaces to be soldered shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to the pipe or tubing and fittings. Such flux shall be noncorrosive and nontoxic after soldering. ~~be applied.~~ Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air /fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and the pipe or tubing. Solder in compliance with ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. ~~The joint shall be soldered with a solder conforming to ASTM B 32.~~ The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint.

Reason: The above proposal provides important language from the standards to aid the end user.

Cost Impact: None

P229-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.8.2-P-FEEHAN

P230 – 12
1101.3 (New), Chapter 14

Proponent: Jeremy Brown, NSF International (Jeremy@nsf.org)

Add new text as follows:

1101.3 Residential water reuse treatment systems. Where gray water or wastewater is treated to produce water for non-potable reuse applications, such treatment systems shall comply with NSF 350.

Add new standard to Chapter 14 as follows:

NSF
350-11 Onsite Residential and Commercial Water Reuse Treatment Systems

Reason: NSF 350 *Onsite Residential and Commercial Water Reuse Treatment Systems* was newly adopted in 2011 as an American National Standard, establishing the minimum materials, design and construction, and performance requirements for systems that treat residential gray water or combined wastewater for non-potable reuse applications, including flushing water for closets and urinals, irrigation and other. Rigorous testing as defined by the standard ensures the treatment systems meet strict effluent quality requirements suitable for reuse applications, along with providing protection of public health and the environment. NSF 350 is currently referenced in the IGCC and IAPMO Green Supplement.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NSF 35-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

P230-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.3-PSD-BROWN

2012 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

MECHANICAL CODE COMMITTEE

Mark Riley, *Chair*
Mechanical Inspector
Safebuilt of Michigan – Inspecting City of Troy, Michigan
Troy, MI

Joseph R. Crum, CBO - *Vice Chair*
Deputy Building Official
City of DeLand
DeLand, FL

Wm. Scott Copp
Sr. Project Manager
T. Y. Lin International
Rochester, NY

David F. Hall, CFM
Director of Inspection Services – Building Official – Floodplain Administrator
City of Georgetown
Georgetown, TX

Dolan (Lanny) Huffman, Jr.
Rep: Air Conditioning Contractors of America
Vice President
Hickory Sheet Metal Co. Inc.
Hickory, NC

Dennis Martinelli
Supervising Combination Inspector
Fairfax County Government
Fairfax, VA

Antoine (Tony) Nassimos
Plumbing/Mechanical Subcode Official/
Construction Official
State of New Jersey-Treasury
Trenton, NJ

James Paschal, PE
Rep: American Society of Plumbing Engineers
Principle Engineer
Paschal Engineering & Forensic Consulting, Inc.
Ypsilanti, MI

Gary L. Scribner
Rep: Jurisdictional Members of the National Board Of Boiler & Pressure Vessel Inspectors
Deputy Chief
Missouri Division of Fire Safety
Jefferson City, MO

Frank Shingleton
Mgr. – Regulatory Management
Viega, LLC
Wichita, KS

Loren Swanson
Rep: NAHB
President
Southern Michigan Heating
Jackson, MI

John K. Taecker, PE
Senior Regulatory Engineer
Underwriters Laboratories, Inc.
San Jose, CA

Richard Vrana
Division Manager, Code Enforcement HVAC
City of Houston
Houston, TX

Staff Liaisons:
Gregg Gress
Senior Technical Staff
International Code Council
Country Club Hill, IL

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

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

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

  G7-12
M1-12
M2-12
M3-12
M4-12
M5-12
M6-12
M7-12
M8-12
M9-12
M10-12
M11-12
M12-12
M13-12
M14-12
M16-12
M17-12
M18-12
M19-12
M20-12
M21-12
M22-12
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M204-12
M205-12
M206-12
M207-12
M208-12
M209-12
M210-12
M211-12
M212-12
M213-12
M214-12

M1– 12
202

Proponent: Thomas Peterson, Brigham City, UT, Brigham City Corporation, representing the Utah Chapter of ICC
(Tpeterson@brighamcity.utah.gov)

Revise as follows:

CONDITIONED SPACE. An area, room or space <u>enclosed within the building thermal envelope</u> that is heated or cooled ~~by any equipment or appliance~~.

Reason: The change provides clarification that conditioned space is required to be inside the building thermal envelope. It also allows an unfinished basement to be considered conditioned space, if enclosed in the building thermal envelope, without the requirement of supply and return air by radiant heat transfer supplied by the non-insulated ductwork system.

Cost Impact: The code change proposal will not increase the cost of construction.

M1-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CONDITIONED SPACE-M-PETERSON.DOC

M2 – 12
202

Proponent: Brent Ursenbach, Salt Lake City, UT, Salt Lake County Planning and Development representing the Utah Chapter ICC
(bursenbach@slco.org)

Revise as follows:

CONDITIONED SPACE. An area, room or space that is ~~being heated or cooled by any *equipment* or *appliance*.~~ enclosed within the building thermal envelope and that is directly heated or cooled or that is indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate thru openings with conditioned spaces, where they are separated from conditioned spaces by un-insulated walls, floors or ceilings and where they contain un-insulated ducts, piping or other sources of heating or cooling.

Reason: Confusion exists between the two different definitions in the IMC and IECC. The IECC attempts to define how a space may be indirectly conditioned; however, further clarification is needed. This proposed change is similar to the definition in ASHRAE 90.1 – 2010.

Cost Impact: The code change proposal will not increase the cost of construction.

M2-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-CONDITIONED SPACE-M-URSENBACH.DOC

M3–12
202

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

EXTRA-HEAVY-DUTY COOKING APPLIANCE. Extra-heavy-duty cooking appliances are those ~~include appliances~~ utilizing open flame combustion of solid fuel at any time. ~~such as wood, charcoal and briquettes. and mesquite to provide all or part of the heat source for cooking.~~

HEAVY-DUTY COOKING APPLIANCE. Heavy-duty cooking *appliances* include electric under-fired broilers, electric chain (conveyor) broilers, gas under-fired broilers, gas chain (conveyor) broilers, gas open-burner ranges (with or without oven), electric and gas wok ranges, smokers, smoker ovens, and electric and gas over-fired (upright) broilers and salamanders.

Reason: The definition of Extra-heavy-duty appliances does not appear to address smokers and smoker grills. The wood is not burned to contribute heat for cooking in these appliances, so these appliances seem to fall through the crack. Smokers would appear to require hoods based on Section 507.2.4. By defining smokers as “Heavy-duty” instead of “Extra-heavy-duty,” they can be placed under a Type I hood with other heavy-, medium- and light-duty appliances. There is no apparent reason for them to be under an independent exhaust system as is required for appliances that have open flame combustion. As revised, the definition distinguishes between appliances that produce only smoke and those that actually combust the solid fuel for heat.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M3-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-HEAVY DUTY COOKING APPLIANCES (NEW)-M-STRAUSBAUGH.PMGCAC.DOC

M4–12
202, Chapter 15

Proponent: Marcelo M. Hirschler, GBH International
(gbhint@aol.com)

Add new definition as follows:

FIRE-RETARDANT TREATED WOOD. A homogeneous wood product that is impregnated with chemicals by a pressure process or other means during manufacture and that complies with the requirements of ASTM E2768.

Add new standard to Chapter 15 as follows:

ASTM E2768-11
Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test) (2011), to Chapter 35, on Referenced Standards.

Reason: The IMC contains a reference to fire-retardant treated wood but no definition. This definition is added, which is consistent with section 2303.2 of the IBC. Note that ASTM has now issued a test method, ASTM E2768, which contains the three requirements discussed in section 2303.2, namely that a product be tested in accordance with ASTM E84 or UL 723, and exhibit a flame spread index of 25 or less, show no evidence of significant progressive combustion when the test is continued for 30 minutes (i.e. an additional 20-minute period over the standard ASTM E84 duration of 10 minutes) and that the flame front not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

The existing definition of "fire-retardant treated wood" in chapter 2 of the IBC is inconsistent with the requirements within section 2303.2 of the IBC in two respects: (a) it can be met by a material that has minimal amount of fire retardant treatment and (b) it requires the fire retardant treatment to be incorporated by a "pressure treatment" and not, as in 2303.2, by a "pressure process or other means during manufacture". During the 2012 ICC code development process this issue was discussed, in proposal S201 (to the IBC and IRC) and associated comments, and the requirements in 2303.2 were upheld. The definition of fire-retardant treated wood in the IMC and in the IBC needs to be a stand-alone definition that contains the requirements and that is consistent with section 2303.2 of the IBC.

Moreover, the addition of the requirement that fire-retardant treated wood must be a "homogeneous" product is necessary to ensure that products that are coated or only partially impregnated with chemicals are not considered "fire-retardant treated wood" as they are not.

The IMC reference to fire-retardant treated wood can be found in section 1402.4.1.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [ASTM E2768-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M4-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FIRE RETARDANT TREATED WOOD-M-HIRSCHLER.DOC

M5–12
202

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new definition as follows:

<u>**FLEXIBLE AIR CONNECTOR**. Flexible air connectors are tested for compliance with UL 181 with the exception of the fire penetration, puncture and impact tests of that standard. Flexible air connectors are labeled as such and are used to connect sections of ductwork, connect ductwork to equipment and connect ductwork to inlet and outlet terminals. The UL181 standard limits the length of flexible air connectors to 14 feet or less.</u>

Reason: The code does not define “flexible air connector.” As seen in the field, flexible air connectors are often indistinguishable from flexible ducts and the only way to tell them apart is to look at their labels. It is the product listing and label that dictates whether the product is an air connector or an air duct.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M5-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FLEXIBLE AIR CONNECTOR-M-STRAUSBAUGH-PMGCAC.DOC

M6–12
202

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Manufacturers Association International

Revise as follows:

GROUND SOURCE HEAT PUMP LOOP SYSTEM. Piping ~~buried~~ installed for the purpose of transporting heat transfer fluid to and from a heat pump and installed in horizontal or vertical excavations below the frost or heat level at a depth where the ground temperature remains relatively constant, ~~or~~ placed in a body of water at a depth to avoid freezing or connected to a free-flowing water source such as a well or stream ~~for the purpose of transporting heat transfer liquid to and from a heat pump~~. ~~Included in this definition are closed loop systems in which the liquid is recirculated and open loop systems in which the liquid is drawn from a well or other source.~~ Closed loop systems recirculate heat transfer liquids containing antifreeze through pressurized pipes while open loop systems extract and return water to the source.

Reason: The potential for confusion in the placement of Loop Systems for Ground Source Heat Pumps exists because of various uses of the phrase “surface of the earth” or “earth” in definitions of Ground Source, Ground Source Heat Pump Technology and Loop Systems. The most common omission in the descriptions is the optimum installation depth at which the “loop” should be placed.

In the IMC definition being addressed in this proposal, the loop system is described as: “piping buried in horizontal or vertical excavations or placed in a body of water for the purpose of transporting heat transfer liquid to and from a heat pump”. No specifications exist for the minimum “burial” depth of the pipe in either the ground or the body of water. This omission could lead to pipes being installed at too shallow a depth in either the ground or body of water causing inefficient operation or failure of the mechanical equipment.

Recent actions in the International Green Construction Code hearings led to changes in the definition of “Ground Source” to the following: “Use of the ground (surface of the earth) as a heat source or sink for heating and/or cooling provided by heat pumps”. This definition change was introduced by Robert Dewey from the U.S. Department of Energy and was approved in final action hearings and does not specify the depth of the heat source or sink.

On U.S. Department of Energy’s Energy Efficiency & Renewable Energy, Geothermal Technologies Program Website: http://www1.eere.energy.gov/geothermal/heatpumps.html it is stated that: “The technology [GSHP] relies on the fact that the Earth (beneath the surface) remains at a relatively constant temperature throughout the year…..”

The two U.S. Department of Energy statements or definitions appear to contradict each other as one refers to “the surface of the earth” and the other refers to “beneath the surface” and neither defines the word “surface”.

To further confuse the matter most non-geologists or lay persons interpret “surface” to be the top most plane of something, the part that is easily touched or seen: for instance, in the sentence – the insect appeared to be walking on the surface of the water – it is clear that the insect is on the very top of the water.

The “surface” of the earth (sometimes referred to as the crust) is described by geologists as the top 5 – 31kilometers of the earth’s crust. Using that scientific description:
The IGCC definition appears to suggest that GSHP Loop systems can be installed anywhere from the top of the ground (where vegetation grows) to a depth of 31 kilometers.

The U.S. DOE description would mean that the loop pipes must be installed below the 5 - 31 kilometer thick surface
Changes to the IMC’s Ground Source Heat Pump Loop System in this proposal defines the optimum depth at which the loop system should be installed and allows for variations based on local conditions. It further clarifies the requirement for installing open loop systems.

Cost Impact: None

M6-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-GROUND SOURCE HEAT PUMP LOOP SYSTEM-M-SAGAN.DOC

M7–12
202

Proponent: James Paschal, Paschal Engineering, representing self
(Jim@PaschalEngineering.com)

Revise as follows:

MECHANICAL JOINT.

1. A connection between pipes, fittings, or pipes and fittings that is not welded, brazed, caulked, soldered, ~~or~~ solvent cemented, or heat-fused.
2. A general form of gas or liquid-tight connections obtained by the joining of parts through a positive holding mechanical construction such as, but not limited to, flanged, screwed, clamped or flared connections.

Reason: Heat fusion is now a defined type of joint for plastic piping, and is considered separate from welding because there is not any additional filler material used in forming the joint. However, heat-fusion joints are not mechanical joints and as such should be excluded from the definition of mechanical joints.

Cost Impact: This proposal will not increase the cost of construction.

M7-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-MECHANICAL JOINT-M-PASCHAL.DOC

M8–12
301.3

Proponent: James Ranfone, representing American Gas Association
(jranfon@aga.org)

Revise as follows:

301.3 Identification. Each length of pipe and tubing and each pipe fitting utilized in a mechanical system shall bear the identification of the manufacturer.

> <u>**Exception:** Manufacturer identification for fittings and pipe nipples shall be on each piece or shall be printed on the fitting or nipple packaging or provided documentation.</u>

Reason: The exception would allow identification of fittings to be provided on or with the packaging. Some piping fittings, short nipples for example, do not have the physical room for a manufacturers mark.

Cost Impact: The code change proposal will not increase the cost of construction.

M8-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

301.3-M-RANFONE.DOC

M9–12
303.3

Proponent: Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

303.3 Prohibited locations. Fuel-fired appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping rooms.
2. Bathrooms.
3. Toilet rooms.
4. Storage closets.
5. Surgical rooms.

Exception: This section shall not apply to the following appliances:

1. Direct-vent appliances that obtain all combustion air directly from the outdoors.
~~2. Solid fuel-fired appliances, provided that the room is not a confined space and the building is not of unusually tight construction.~~

~~3~~ 2 Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with Chapter 7. Access to such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door air leakage requirements of the *International Energy Conservation Code* and equipped with an approved self-closing device.

Reason: The terms “confined space” and “unusually tight construction” are no longer referenced in the IMC, and can no longer dictate the installation of these appliances.

Cost Impact: The code change proposal will not increase the cost of construction.

M9-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.3-M-GRACE.DOC

M10–12
303.3

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

303.3 Prohibited locations. Fuel-fired appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping Rooms
2. Bathrooms
3. Toilet Rooms
4. Storage Closets
5. Surgical Rooms

Exception: This section shall not apply to the following appliances:

1. Direct-vent appliances that obtain all combustion air from the outdoors.
2. Solid fuel-fired appliances, provided that ~~the room is not a confined space and the building is not of unusually tight construction~~ combustion air is provided in accordance with the manufacturers' instructions.
3. Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with Chapter 7. Access to such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door leakage requirements of the International Conservation Code and equipped with an approved self-closing device.

Reason: The concepts of confined space and unusually tight construction are no longer valid and were deleted from the IFGC along with the definitions of such.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M10-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.3-M-STRAUSBAUGH-PMGCAC.DOC

M11–12
303.5

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

303.5 Indoor locations. Furnaces and boilers installed in closets and alcoves shall be listed for such installation. ~~For purposes of this section, a closet or alcove shall be defined as a room or space having a volume less than 12 times the total volume of the fuel-fired appliances other than boilers and less than 16 times the total volume of boilers. Room volume shall be computed using the gross floor area and the actual ceiling height up to a maximum computation height of 8 feet.~~

Reason: This section needs to be coordinated with the IFGC. The volume rules for 12 times and 16 times the appliance volume, along with the concept of "rooms large in comparison with the appliance" were deleted from the IFGC and are a thing of the past. This IMC text is based on IFGC text that is antiquated and no longer existing in the IFGC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M11-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

303.5-M-STRAUSBAUGH-PMGCAC.DOC

M12–12
304.10

Proponent: Jay F. Rowland, J.F.R. Enterprises, Inc., representing himself

Revise as follows:

304.10 Clearances from grade. Equipment and *appliances* installed at grade level shall be supported on a level concrete slab or other *approved* material extending not less than 3 inches (76 mm) above adjoining grade. Prefabricated supports placed on grade without excavation shall maintain ground contact around the support perimeter. Soil shall be backfilled under the support in a manner that will resist erosion and settling. Alternatively, the equipment and appliances ~~or~~ shall be suspended not less than 6 inches (152 mm) above adjoining grade. Such support shall be in accordance with the manufacturer's installation instructions.

Reason: "Other approved materials" (plastic and lightweight concrete pads) have seen continuous reduction of material/ribbing over the years as manufacturers lower costs and compete for market share. Plus, they want to make a lighter product that is friendly to installers. This suggested code change reminds manufacturers and installers that the equipment pads are expected to remain level over time, not just initial installation. Don't "set it and forget it" unless it's set correctly.

Take a look at homes in your neighborhood, and you will see that a large percentage of prefab equipment pads have been installed and maintained improperly. Too many pads have lost all soil under their downslope edges and are held in place largely by the weight of the unit and the line set. On the other hand, many pads have no clearance from grade.

Unfortunately, neither manufacturers nor techs have put enough focus on proper excavation of the soil, backfilling, placing rock around the pad, or other steps to resist erosion and settling (which will still occur to some degree even with a perfect install). We stop short of requiring strip footers tied into the pad from below. That's the best way to stop erosion, but it adds a higher cost, and the manufacturers can come up with similar options.

Installation instructions have been insufficient to address these common issues. In fact, prefab pads as currently made (3" height, and many of 2" height) cannot meet code if the site is properly excavated. Excavation requires going below grade, and a 3" pad cannot then extend 3" above grade. With 3" pads, the best option is to provide protection for the soil under and around the pad. Some calculations by a registered engineer are attached as substantiation of the significance of erosion.

In a nutshell, ground contact/support and erosion control (protecting soil under and around the pad) determine the actual clearance from grade.

Note: Rock, landscaping fabric, etc. should not be placed under a pad, so erosion channels aren't created.

Cost Impact: The code change proposal will not increase the cost of construction. If you expressly require strip footing or a similar solution, then the cost of construction will increase.

M12-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

304.10-M-ROWLAND.DOC

M13–12
304.10

Proponent: Tom Allen, representing himself

Revise as follows:

304.10 Clearances from grade. Equipment and *appliances* installed at grade level shall be supported on a level concrete slab or other *approved* material extending not less than 3 inches (76 mm) above adjoining grade or shall be suspended not less than 6 inches (152 mm) above adjoining grade. Such support shall be in accordance with the manufacturer's installation instructions.

> **Exception:** Existing support platforms shall not be required to comply with the heights above grade specified in this section where such platforms complied with the applicable code when originally installed.

Reason: Adds an exception for existing support platforms that met code when they were installed.

Cost Impact: There is no cost impact.

M13-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

304.10-M-ALLEN.DOC

M14–12
[B]304.11

Proponent: Gary Kreutziger, M.C.P., City of San Antonio, representing self (gkreutziger@sanantonio.gov)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

[B] 304.11 Guards. Guards shall be provided where appliances, *equipment,* fans or other components that require service and roof hatch openings are located within 10 feet (3048mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762mm) above the floor, roof, or grade below. The guard shall extend not less than 30 inches (762mm) beyond each end of such appliances, *equipment,* fans, <u>or</u> components ~~and roof hatch openings~~ and the top of the guard shall be located not less than 42 inches (1067mm) above the elevated surface adjacent to the guard. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code.*

Reason: The change will correlate the IMC with the IBC and IFC where there is currently a conflict. The IBC and IFC do not require the guards to extend 30 inches beyond a roof hatch opening as is currently required in the IMC. There are manufactured guards available now that mount directly to the roof hatch curb and encircle the roof hatch opening but do not extend 30 inches beyond the opening as required in the IMC, however, as the IMC is currently written these guards would not be allowed, but are allowed per the IBC and IFC. These guards meet the prescriptive requirements and intent of the IBC and IFC but not the IMC. The guards that encircle the roof hatch opening provide a safer access to the roof when oriented correctly, by serving as a handrail as well as a guard and also add value by limiting roof penetrations.

Cost Impact: The code change proposal will not increase the cost of construction.

M14-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

[B]304.11-M-KREUTZIGER

M15–12
305.4, Chapter 15

Proponent: Robert O'Neill; David Thompson, Manufacturers Standardization Society, representing Manufacturers Standardization Society
(dthompson@mss-hq.org)

Revise as follows:

305.4 Interval of support. Piping shall be supported at distances not exceeding the spacing specified in Table 305.4, or in accordance with ~~MSS SP-69~~ <u>ANSI/MSS SP-58-2009.</u>

Add new standard to Chapter 15 as follows:

<u>ANSI/MSS SP-58-2009</u>
<u>Pipe Hangers and Supports –Materials, Design, Manufacture, Selection, Application, and Installation</u>

Reason: In 2009, SP-58 was revised (including the title) to comprehensively combine and incorporate all of the content of five Pipe Hanger and Support standards into a single document; specifically including all of the information from **ANSI/MSS SP-69-2003, *Selection and Application***; MSS SP-77-1995 (R 2000), *Guidelines for Pipe Support Contractual Relations*; MSS SP-89-2003, *Fabrication and Installation Practices*; and MSS SP-90-2000, *Guidelines on Terminology for Pipe Hangers and Supports*. On February 11, 2011, the revised SP-58 was approved by the American National Standards Institute (ANSI) as an American National Standard (ANS). The new title is **ANSI/MSS SP-58-2009, *Pipe Hangers and Supports –Materials, Design, Manufacture, Selection, Application, and Installation***. The aforementioned SP-69 <u>will not be revised</u> (will "sunset" by 2014) and SP-77, 89, and 90 were withdrawn in 2010. **This ANSI/MSS SP-58-2009 edition can officially be utilized and referenced in place of the aforementioned Standard Practices.**

Cost Impact: The code change proposal will not increase the cost of construction other than the minimal difference in cost to acquire the ANSI/MSS SP-58-2009 standard document.

Analysis: A review of the standard proposed for inclusion in the code, [ANSI/MSS SP-58-2009] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M15-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

305.4-M-ONEILL-THOMPSON.DOC

M16–12
TABLE 305.4

Proponent: Larry Gill, P. Eng., IPEX USA LLC (larry.gill@ipexna.com)

Revise as follows:

TABLE 305.4
PIPING SUPPORT SPACING[a]

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
PE-RT ≤ 1”	2 ⅔ (32 inches)	4
PE-RT ≥ 1¼	4	4

Reason: Add support dimensions for polyethylene of raised temperature (PE-RT). PE-RT is already in the International Codes and adding the support spacing will provide additional information for installation. All other dimensions in the table remain unchanged.

Cost Impact: The proposed change will not increase the cost of construction.

M16-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T305.4-M-GILL.DOC

M17–12
305.5

Proponent: Jillian M. Frenkel – Georgia Licensed Residential Builder

Revise as follows:

305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than 11/2 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

<u>In concealed locations where piping other than cast iron or steel is installed within exterior wall cavities formed by framing members, and such piping is less than 1 ½ inches from the inside surface of the exterior wall sheathing, such piping shall be protected for its entire length within the cavity by shield plates have a minimum thickness of 0.0575 inch (1.463mm) (16 Gage).</u>

Reason: Currently, the code requires protection by use of steel shield plate at the top and sole plates. This proposition is to add protection to mechanical lines that are located on exterior walls within the bays formed by framing members as seen in Figure 1. These unprotected lines can be punctured by installation of exterior coverings (i.e. siding, shake, etc) and left undetected during the building process or later by the homeowner. The reason/intent for the revision to the existing code is to prevent hazardous conditions and/or expensive repairs.

An example of a hazardous condition is a punctured refrigerant line. When a line is first punctured, the seal may be so tight that a leak is left undetected. In time, the metals will corrode and Freon will eventually leak out of the refrigerant lines. Over time, exposure to Freon can cause health issues ranging from minor to severe. It is documented that effects of Freon exposure via inhalation include mouth and nasal area irritation, dizziness and irregular heartbeat.

In yet another scenario, a punctured condensation line has the potential to become an unnecessary and expensive repair which can result in drywall repair, mechanical line repair, floor replacement, possibly insulation replacement and paint repair.

Cost Impact: The code change proposal will increase the cost of construction. The cost is roughly $40/10ft wall.

M17-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

305.5-M-FRENKEL.DOC

M18–12
306.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

306.1 Access. Appliances, <u>controls devices, heat exchangers and HVAC system components that utilize energy</u> shall be accessible for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.

Reason: Section 306.1 applies to appliances and therefore does not address equipment such as fan/coil units, air handling units, damper motors, HVAC controls, etc. Units with heat exchangers need to be provided with access so that they can be cleaned. Air handlers and fan/coil units are not considered to be appliances because they do not fall under the definition because the code provides no specific requirements for them.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This could increase the cost of construction.

M18-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

306.1-M-STRAUSBAUGH-PMGCAC.DOC

M19–12
306.3.2 (NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

306.6 Air Handling Units. Air handling units shall not be located in attics in dwelling units except where all of the following conditions are met:

1. A device is installed to alert the owner or shut off the unit when the condensation drainage system has failed.
2. The attic access opening is large enough to allow replacement of the air handler.
3. A notice is posted on the electric service panel indicating to the homeowner that an air handler is located in the attic. Such notice shall be in uppercase letters, in 16 point type, and with the title and first paragraph in bold and shall read as follows:

NOTICE TO HOMEOWNER

A PART OF YOUR AIR CONDITIONING SYSTEM, THE AIR HANDLER, IS LOCATED IN THE ATTIC. FOR PROPER, EFFICIENT, AND ECONOMIC OPERATION OF THE AIR CONDITIONING SYSTEM, YOU MUST ENSURE THAT REGULAR MAINTENANCE IS PERFORMED.

YOUR AIR CONDITIONING SYSTEM IS EQUIPPED WITH ONE OR BOTH OF THE FOLLOWING: 1) A DEVICE THAT WILL ALERT YOU WHEN THE CONDENSATION DRAIN IS NOT WORKING PROPERLY OR 2) A DEVICE THAT WILL SHUT OFF THE SYSTEM WHEN THE CONDENSATION DRAIN IS NOT WORKING. TO LIMIT POTENTIAL DAMAGE TO YOUR HOME, AND TO AVOID DISRUPTION OF SERVICE, IT IS RECOMMENDED THAT YOU VERIFY PROPER WORKING ORDER OF THESE DEVICES BEFORE EACH SEASON OF PEAK OPERATION.

Reason: Adds prescriptive requirements and notice requirements for air handler units in attics.

Cost Impact: There is a cost impact.

M19-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

306.3.2 (NEW)-ALLEN.DOC

M20–12
307.2

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Air-Conditioning, Heating & Refrigeration Institute
(pmclaugma@aol.com)

Revise as follows:

307.2 Evaporators and cooling coils. Condensate drain systems shall be provided for *equipment* and appliances containing evaporators or cooling coils. Condensate drain systems shall be designed, constructed and installed in accordance with Sections 307.2.1 through 307.2.4.

> **Exception:** Evaporators and cooling coils that are designed to operate in sensible cooling only and not support condensation shall not be required to meet the requirements of this section.

Reason: The introduction of chilled beam technology is relatively new in the North American market. The code does not take into consideration the fact that dry coils are utilized in most all chilled beam designs; it is an integral part of the design. The chilled beam products have been successfully operating in applications all over the world in this dry manner for over 25 years. Additionally, it is more hygienic and provides greater energy efficiency to design these systems with dry coils. Finally condensation prevention strategies are already employed as part of the design of chilled beam systems.

Cost Impact: The code change proposal will not increase the cost of construction.

M20-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2-M-MCLAUGHLIN.DOC

M21–12
307.2.2

Proponent: Tom Allen, representing self

Revise as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the *International Plumbing Code* relative to the material type. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

> **Exception:** Where the drain pipe is less than 10 feet (3048 mm) in length for wall mounted ductless split units with a cooling capacity of less than 36,001 Btu/h, the size of the drain pipe need not be larger than the size of the factory drain outlet on the equipment.

Reason: Exception for small units that utilize a smaller drain than allowed by the table.

Cost Impact: There is no cost impact.

M21-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.2-M-ALLEN.DOC

M22–12
307.2.2

Proponent: James Paschal, Paschal Engineering, representing self
(Jim@PaschalEngineering.com)

Revise as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, ~~polybutylene~~, polyethylene, ABS, CPVC, ~~or~~ PVC, or polypropylene pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the *International Plumbing Code* relative to the material type. Condensate waste and drain line size shall not be less than ¾-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

Reason: Delete PB material as it is no longer available or used in this application, and add polypropylene materials which are currently being used in this application.

Cost Impact: None

M22-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.2-M-PASCHAL.DOC

M23–12
307.2.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate:

(1. thru 3. No change)

4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in ~~the primary drain line,~~ the overflow drain line~~,~~ or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

Reason: When these devices are installed in the primary drain line, they are not typically installed where the primary line connects to the equipment supplied drain pan. They are typically installed in the uppermost vertical level above the P-trap (approximately 6 or so inches horizontal of the unit itself). If a blockage occurs at the connection point of the primary line to the equipment supplied drain pan, or within the 6” piece of horizontal pipe between the unit and the detection device, the pan will fill and overflow without detection.

Cost Impact: The code change proposal will not increase the cost of construction.

M23-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.3-M-GRACE.DOC

M24–12
307.2.3

Proponent: Jay F. Rowland, J.F.R. Enterprises, Inc., representing himself (code@jfrenterprises.com)

Revise as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of $1^1/_2$ inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage). Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
   The auxiliary drain pan shall be provided with a water-level detection device conforming to UL 508 that will shut off the *equipment* served prior to overflow of the pan, or when condensate is sensed in the pan.
2. A separate overflow drain line shall be connected to the primary drain pan provided with the *equipment*. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
   A water-level detection device conforming to UL 508 shall be provided that will shut off the *equipment* served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.
3. ~~An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the *equipment* served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.~~
4. ~~A water-level detection device conforming to UL 508 shall be provided that will shut off the *equipment* served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.~~

   Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

Reason: This code change is requested in order to bring the code in line with traditional best practices. The end result is building occupants saved from condensate catastrophes.

For decades, contractors have commonly installed three lines of protection against condensate overflow. Besides the drain line from the primary drain pan, they installed a secondary drain pan with a drain line *and* a float switch or similar device in the secondary drain pan. This practice is still common today, as evidenced by the strong tandem sales of shut-off devices along with secondary pans with holes pre-drilled.

Yet the code allows the installer to drop one line of protection as a way of saving a little money in the short run. The current requirement is for the drain from the primary pan to be backed up by only one other option. If the secondary drain line clogs, and there is no shut-off device, then the building is damaged. If the shut-off fails, and there is no secondary drain, then the building is damaged. The risk of a secondary device failing is significant, so a tertiary device isn't overkill. It is wise.

The code body should not assume that equipment is properly installed or maintained or, even if it is, that mechanical devices will always perform as desired. Especially over time, as all things perform less effectively as they age.

The IRC review committee tried to address this issue in its corresponding code section M1411.3.1 by adding the requirement of a secondary drain or pan. We have also submitted a code change request to clarify that section, as the language is a bit ambiguous. We hope, however, that the wording in both codes will be harmonized.

This code change uses existing language in a different arrangement (making methods 3 & 4 part of methods 1 & 2, respectively).

Note: We added the word “primary” to method 2 because some equipment is provided with both primary and secondary drain pans.

Cost Impact: The code change proposal will not increase the cost of construction. At least this is true for the contractors who protect their customers and follow the traditional best practices. Alternatively, we would point out that the cost of keeping the third line of defense against condensate damage is much lower than the cost of re-construction after damage is done. This type of water damage often is not covered by property insurance. Thank you for your consideration.

M24-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.3#1-M-ROWLAND.DOC

M25–12
307.2.3

Proponent: Jay F. Rowland, J.F.R. Enterprises, Inc., representing himself (code@jfrenterprises.com)

Revise as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of $1^1/_2$ inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage)<u>, shall have seamless corners, and the interior shall be coated with a waterproof material</u>. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the *equipment*. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the *equipment* served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water-level detection device conforming to UL 508 shall be provided that will shut off the *equipment* served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

   Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

Reason: This code change is proposed to address the quality of drain pans, which play an obviously key role in preventing damage due to condensate.

First, we suggest that drain pan corners be "seamless," such as folded corners for metal pans. Notched corners that are later caulked, or perhaps welded, are prone to error.

More importantly, we suggest that drain pans essentially be rustproof. Resisting rust is not sufficient, because the drain pan is the one thing that should not rust through…and the technologies and products available today provide easy solutions. Polymer coatings, plastic pans, etc. have been used and proven for years. We've never seen a plastic pan rust through.

We stop short of saying that the entire pan must be rustproof, and focus only on the interior of the pan, because galvanized steel is so widely used. However, popularity does not justify its continued widespread use for this application. Whenever serious damage is caused to a building due to a rusted or leaky pan, it's a pretty safe bet that the pan was galvanized steel.

We believe this code change will increase the quality of construction and reflect well on the code.

Cost Impact: The code change proposal will increase the cost of construction. We hesitate to say there will be no increase in cost on commercial installations, but we believe any increase will be negligible…more psychological than real. Galvanized pans will have to be coated before installation, rather than after they start to rust. Alternatively, the installer may use a plastic pan.

If the auxiliary pan is viewed properly as insurance, then any cost difference is more than offset by not having to repair ceilings and other building components due to flooding (which is often not covered by property insurance). Thank you for your consideration.

M25-12

Public Hearing: Committee: AS AM D

M26– 12
202 (NEW), Section 307.2.3.1

Proponent: Timothy Burgos, InterCode Incorporated, representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self
(ken@nrgcodeadvocates.com)

Add new definition as follows:

DUCTLESS MINI-SPLIT SYSTEM. A heating and cooling system that is comprised of one or multiple indoor evaporator/air handler units and an outdoor condensing unit that is connected by refrigerant piping and electrical wiring. A ductless mini-split system is capable of cooling or heating one or more rooms without the use of a traditional ductwork system.

Revise as follows:

307.2.3.1 Water-level monitoring devices and condensate pumps. On down-flow units and all other coils that do not have a secondary drain or provisions to install a secondary or auxiliary drain pan, a water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the *equipment* served in the event that the primary drain becomes restricted. Devices installed in the drain line shall not be permitted. For ductless mini-split equipment that is not able to drain condensate from the unit by gravity, a condensate pump shall be installed to remove water from the *equipment.* The condensate pump shall be powered by the same power supply that powers the *equipment* being served and shall be capable of shutting off the equipment served in the event of failure of the pump to remove condensate.

Reason: Ductless mini-split systems have existed for more than 50 years and have been available for more than 30 years in the United States HVAC residential and/or light commercial markets. Most American consumers, however, are unaware of these products. A ductless mini-split system is not a window unit; it is a permanently installed mechanical system used in new construction, additions, multi-family (condo/apartment) housing, and to improve comfort in poorly conditioned spaces.

Ductless Mini-split equipment must follow the same code requirements as other condensate producing equipment due to the potential damage and health risk associated with uncontrolled condensation. Ductless mini-split units also do not have provisions for a secondary drain, or auxiliary drain pans to prevent condensation from overflowing the primary drain pan. Currently it is unclear in the code if ductless mini-split units require water-level monitoring devices. In installations where gravity drains condensation removal is impossible, a condensate pump must be installed that communicates with the ductless mini-split to stop the equipment if there is a failure of the condensate removal system. Power for the condensate pump should be provided from the mini-split equipment and not from a separate power source. The danger of using a separate power supply is that if the circuit that supplies power to the condensate pump fails, but the circuit providing power to the mini split equipment remains active, the pump will not operate and the equipment will produce excessive condensation without shutting down. This code change addresses the condensate requirement and allows simplicity in code compliance.

Cost Impact: The code change proposal will not increase the cost of construction.

M26-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-DUCTLESS MINI SPLIT SYSTEM (NEW) #2-M-BURGOS-SAGAN.DOC

M27–12
307.2.3.2

Proponent: Riley Archer, Rectorseal Corporation, representing Rectorseal Corporation (rileya@rectorseal.com)

Add new text as follows:

307.2.3.2 Ductless Mini split water-level monitoring devices and condensate pumps. A water-level monitoring device shall be installed inside the main drain pan of mini-split *equipment*. Such device shall shut off the *equipment* served in the event that the primary drain becomes restricted. For ductless mini split equipment that cannot drain condensation from the unit by gravity, a separate condensate pump shall be installed to remove water from the *equipment*, in addition to a water-level monitoring device. The condensate pump shall be capable of shutting off the equipment in the event that the condensate removal system has failed and shall be connected to the same electrical branch circuit as the *equipment* being served.

Reason: Ductless mini split equipment must follow the same regulations as other condensate producing equipment, due to the potential damage and health risk associated with uncontrolled condensation. Ductless mini split units also do not have provisions for secondary drain, secondary or auxiliary drain pans to prevent condensation from overflowing the primary drain pan. Currently it is unclear in the code language if mini split units require water-level monitoring devices. Applications where the ability to drain condensation with the use of gravity is not possible a condensate pump must be installed with the ductless mini split equipment. This pump should be able to stop the equipment for producing condensation if there is a failure in the condensate removal system. The condensate pump should be powered by the mini split equipment itself to ensure that a separate power supply is not used. The danger of using a separate power supply is that if the circuit that supplies power to the condensate pump fails, but the circuit providing power to the ductless mini split equipment remains active the pump will not operate and the equipment will produce condensation without shutting down. Both a condensate pump and water-level monitoring device are necessary due to restrictions occurring inside the drain pan and inside the condensate line will trip each devices cut off functions separately.

Cost Impact: There is little to no cost impact.

M27-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.3.(NEW)-M-ARCHER.DOC

M28–12
307.2.4

Proponent: Timothy Burgos, InterCode Incorporated, representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self
(ken@nrgcodeadvocates.com)

Revise as follows:

307.2.4 Traps. Condensate drains shall be trapped as required by the *equipment* or *appliance* manufacturer. Traps shall be transparent to allow for visual inspection and shall be designed to allow routine cleaning.

Reason: Using premade clear taps will allow for visual confirmation that there is no clog in the trap and that water is flowing properly. Clear taps have been readily available for years and are as easily installed as a non-pre-manufactured trap.

Cost Impact: The code change proposal will not increase the cost of construction.

M28-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-DUCTLESS MINI SPLIT SYSTEM (NEW) #1-M-BURGOS-SAGAN.DOC

M29–12
202, 307.2.4.1

Proponent: Timothy Burgos, InterCode Incorporated, representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self

Add new definition as follows:

<u>**DUCTLESS MINI-SPLIT SYSTEM.** A heating and cooling system that is comprised of one or multiple indoor evaporator/air handler units and an outdoor condensing unit that is connected by refrigerant piping and electrical wiring. A ductless mini-split system is capable of cooling or heating one or more rooms without the use of a traditional ductwork system.</u>

Add new text as follows:

<u>**307.2.4.1 Ductless Mini-Split Traps.** Ductless mini split equipment that produces condensation shall be provided with an inline check valve located in the drain line instead of a trap.</u>

Reason: Ductless mini-split condensate lines are direct openings for unconditioned outside air, contaminants, insects and other undesirable materials to enter the conditioned space and should be trapped using an inline check valve as a preventative measure.

Ductless mini-split systems have existed for more than 50 years and have been available for more than 30 years in the United States HVAC residential and/or light commercial markets. Most American consumers, however, are unaware of these products. A ductless-mini split system is not a window unit; it is a permanently installed mechanical system used in new construction, additions, multi-family (condo/apartment) housing, and to improve comfort in poorly conditioned spaces. Since mini-splits require no ducts and indoor components are mounted directly on interior ceiling, walls, or on the floor, they avoid the energy losses associated with ductwork of central forced air systems. Duct losses can account for more than 30% of energy consumption for space conditioning, especially if the ducts are in an unconditioned space such as an attic.

Ductless mini-split heating and cooling systems are highly efficient products that deliver warm or cool air directly into different zones in a building instead of through ducts. They are also called mini-split, multi-split, or variable refrigerant flow (VRF) heat pump systems. They are an increasingly popular and cost-effective solution to replace inefficient baseboard electric heating and window air conditioners in existing homes.

Ductless mini-split systems have numerous potential applications in residential, commercial, and institutional buildings. The most common applications are in multifamily housing or as retrofit add-ons in houses with "non-ducted" heating systems, such as hydronic (hot water heat), radiant (electric resistance), and space heaters (wood, kerosene, propane). They can also be a good choice for room additions and small apartments where extending or installing distribution ductwork (for a central air-conditioner or heating systems) is not feasible or where existing equipment cannot handle the additional load.

A ductless mini-split system is comprised of an indoor unit called the evaporator and an outdoor unit called the condenser. The evaporator is connected to the condensing unit by copper tubing and electrical wiring which is passed through a 2 ½" – 4" hole. Basically, it is a small central air unit with the flexibility of cooling or heating one or more room.

The advantages of installing a ductless mini-split over a central air system.

The main advantages of a ductless mini-split are their small size and flexibility for zoning or heating and cooling individual rooms. Models can have as many as four indoor air handling units (for four zones or rooms) connected to one outdoor unit. The number of units is determined by how much heating or cooling is required for the building or each zone (which in turn is affected by the properties of the building envelope). Since each of the zones has its own thermostat, the space can be conditioned only when occupied saving energy and money.

1. With Central Air, an entire home must be cooled when only one room may be occupied. Ductless mini-splits cool only the areas that require conditioning.
2. 18,000 BTU is a typical minimum central air unit: ductless mini-splits are available beginning at 9,000 or 12,000 BTUs.
3. Typical homes requiring 3-ton HVAC units may not be zoned or require complex zoning systems that are very expensive for the homeowner. With ductless mini-splits, multiple evaporators make zoning as simple as setting a remote control.
4. Energy wasted in long lengths of uninsulated ductwork means higher energy bills. Less than 5% cooling loss occurs in insulated refrigerant lines compared with up to 25% through ducts.
5. Retrofitting existing homes with whole house air conditioning requires cutting holes in walls, floors, ceilings or decreasing closet space with ducts.
6. Ductless mini-splits require just a 2 ½ or 4" diameter hole in the outside wall meaningless mess and better home aesthetics.

Most systems now incorporate inverter-driven compressors, which allow for system ramp-up until the desired set temperature is met, then permit the system to modulate its operation so that a comfortable temperature is maintained. This operation avoids the abrupt and energy-consuming start and stop exhibited by traditional HVAC systems.

Ductless mini-split systems are also often easier to install than other types of space conditioning systems. For example, the hook-up between the outdoor and indoor units generally requires only a three inch (~8 centimeter [cm]) hole through a wall for the conduit. Also, most manufacturers of this type of system can provide a variety of lengths of connecting conduits. So, if necessary, you can locate the outdoor unit as far away as 50 feet (~15 meters [m]) from the indoor evaporator. This makes it possible to cool rooms on the front side of a building with the compressor in a more appropriate or inconspicuous place on the outside of the building.

Indoor air handlers can be suspended from a ceiling, flush-mounted in a drop ceiling, or hung on a wall. Floor-standing models are also available. Many offer a remote control to make control of high mounted units easier. Split systems can also contribute to the security of a building by eliminating the need for larger openings required for through-the-wall units or unsecured windows housing window-mounted units –openings that can provide easy access for intruders

Ductless mini-split equipment must follow the same code requirements as other condensate producing equipment due to the potential damage and health risk associated with uncontrolled condensation. Ductless mini-split units also do not have provisions for a secondary drain, or auxiliary drain pans to prevent condensation from overflowing the primary drain pan. Currently it is unclear in the code if ductless mini-split units require water-level monitoring devices. In installations where gravity drains condensation removal is impossible, a condensate pump must be installed that communicates with the ductless mini-split to stop the equipment if there is a failure of the condensate removal system. Power for the condensate pump should be provided from the mini-split equipment and not from a separate power source. The danger of using a separate power supply is that if the circuit that supplies power to the condensate pump fails, but the circuit providing power to the mini split equipment remains active, the pump will not operate and the equipment will produce excessive condensation without shutting down.

Cost Impact: The code change proposal will not increase the cost of construction.

M29-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-DUCTLESS MINI SPLIT SYSTEM (NEW)-M-BURGOS.DOC

M30–12
307.2.5 (NEW)

Proponent: Tom Allen, representing self

Add new text as follows:

<u>**307.2.5 Pipe insulation.** Horizontal primary condensate drains located within unconditioned spaces shall be insulated and provided with a vapor barrier to prevent condensation from forming on the exterior of the drain pipe.</u>

Reason: adds requirement to prevent condensation on exterior of drain pipe

Cost Impact: There is a cost impact.

M30-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.5(NEW)-M-ALLEN.DOC

M31–12
202

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

IMC [B] DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard area map. In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building's* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

Reason: This definition is controlled by the IBC; this proposal brings the IPC, IMC, IFGC, and IPSDC definitions in line with the term as defined by the IBC.

Cost Impact: None

M31-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

M31-202-M-DESIGN FLOOD ELEVATION-M-INGARGIOLA-WILSON-QUINN.DOC

M32–12
307.2.5 (NEW)

Proponent: Andrew Scott Jones, President, A Better Deal Heating and Air Conditioning, Inc., a Texas Corporation, representing himself.
(tfkolter@gmail.com/tom.kolter@yahoo.com)

Add new text as follows:

307.2.5 Cleanouts. Condensate drains shall be provided with a means to allow cleaning of the drain and clearing of blockages without having to cut or disassemble the piping.

Reason: Drain line stoppages in evaporative coils drain pan drain lines are unavoidable and common occurrences requiring clearing the drain line. Clearing these lines almost always involves cutting the drain line itself, causing water to leak into the attic or closet where the drain is located, possible collected in a bucket or soaked up with rags or paper towels. Then the technician blows compressed air through the drain line in both directions from the cut. The cut must be repaired by resealing the drain line with a PVC coupling and solvent.

This process exposes the surrounding area to water leakage and spilling with the risk of damage, mold, spilling, as well as the extra time and effort of carrying extra equipment, parts and flammable solvent. The process takes extra time and costs the homeowner more money.

With a device that permits the introduction of compressed air or nitrogen directly into the drain system permitting clearing in both directions, there is no spillage of water, no cost for the couplings or solvent and no risk of water damage or mold. The entire process requires less than five minutes.

Typically the cost of clearing a drain equipped with such a device is at least 50% less to the homeowner than the cost of clearing a blockage through the common method of cutting the pipe, attempting to collect the condensate water and repairing the cut in the drain line.

Each time a drain line is cleared though the cutting/repair process, the repair could be accomplished by installing a $15.00 line clearing device rather than a simple coupling.

Also, if clearing the drain lines were part of regular maintenance, line blockages could largely be prevented in the first place.

Cost Impact: The code change will increase the cost of construction, totaling an estimated $15.00 per unit.

M32-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.3-M-JONES.DOC

M33–12
307.2.5

Proponent: Riley Archer, Rectorseal Corporation, representing Rectorseal Corporation (rileya@rectorseal.com)

Add new text as follows:

307.2.5 Back-flow prevention. Where the condensate drains from multiple appliances or equipment share common drain piping, a self-sealing check valve device shall be installed in the condensate line at the primary condensate pan. This device shall prevent condensate form flowing back into the *equipment* in the event of a blockage in the main drain line and shall be provided with a cleanout opening and a means to allow visual inspection of condensate flow.

Reason: On multi-story or single story buildings where multiple air conditioning units are tied into a common condensate line a clog in the disposal line will cause water to back up into the drain pans of all lower units tied into the condensate disposal line. This will occur even if all units are equipped with water-level detection devices due to the fact that the equipment on the lower level will shut down due to a backup, but the equipment on the higher level will continue to operate until water reaches the water-level detection device at that level. A manual cleanout is necessary to allow for removal of the clog within the line without cutting the condensate line to do so. The device must be capable of visual inspection to allow for view of check valve and flow of condensate.

Cost Impact: This code change proposal will increase the cost of construction.

M33-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.2.5 (NEW)-M-ARCHER.DOC

M34–12
202, 308

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

PROTECTIVE ASSEMBLY (REDUCED CLEARANCE). Any noncombustible assembly that is *labeled* or constructed in accordance with Table 308.~~6~~4.2 and is placed between combustible materials or assemblies and mechanical appliances, devices or *equipment*, for the purpose of reducing required airspace clearances. Protective assemblies attached directly to a combustible assembly shall not be considered as part of that combustible assembly.

308.4 Allowable reduction. The reduction of required *clearances* to combustible assemblies or combustible materials shall be based on the utilization of a reduced *clearance* protective assembly in accordance with Section 308.~~5~~4.1 or 308.~~6~~4.2.

308.~~5~~4.1 Labeled assemblies. The allowable clearance reduction shall be based on an approved reduced clearance protective assembly that is listed and labeled in accordance with UL 1618.

308.~~6~~4.2 Reduction table. The allowable *clearance* reduction shall be based on one of the methods specified in Table 308.~~6~~4.2. Where required *clearances* are not listed in Table 308.~~6~~4.2, the reduced *clearances* shall be determined by linear interpolation between the distances listed in the table. Reduced *clearances* shall not be derived by extrapolation below the range of the table.

308.~~7~~5 Solid fuel-burning appliances. The *clearance* reduction methods specified in Table 308.~~6~~4.2 shall not be utilized to reduce the *clearance* required for solid fuel-burning appliances that are *labeled* for installation with clearances of 12 inches (305 mm) or less. Where appliances are *labeled* for installation with *clearances* of greater than 12 inches (305 mm), the *clearance* reduction methods of Table 308.~~6~~4.2 shall not reduce the *clearance* to less than 12 inches (305 mm).

308.~~8~~6 Masonry chimneys. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the *clearances* required for masonry *chimneys* as specified in Chapter 8 and the *International Building Code*.

308.~~9~~7 Chimney connector pass-throughs. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the *clearances* required for *chimney* connector pass-throughs as specified in Section 803.10.4.

308.~~10~~8 Masonry fireplaces. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the *clearances* required for masonry fireplaces as specified in Chapter 8 and the *International Building Code*.

308.~~11~~9 Kitchen exhaust ducts. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the minimum *clearances* required by Section 506.3.11 for kitchen exhaust ducts enclosed in a shaft.

TABLE ~~308.6~~ 308.4.2
CLEARANCE REDUCTION METHODS[b]

(Portions of table and footnotes not shown remain unchanged)

b. For limitations on clearance reduction for solid fuel-burning appliances, masonry chimneys, connector pass-throughs, masonry fire places and kitchen ducts, see Sections ~~308.7 through 308.11~~ 308.5 through 308.9.

Reason: Provide clarity that there are two different methods for reducing clearances.

Cost Impact: None

M34-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

308.4-M-EUGENE.DOC

M35–12
[B] 309.2 (NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE PROPOSAL WILL BE HEARD BY THE IBC-GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

[**B] 309.2 Space-cooling systems.** Where the Dry bulb 2 ½ % Summer Design Temperature as determined in accordance with Appendix D of the *International Plumbing Code* is 92° F or greater, occupancies in groups E, I1, I2, I4 and R shall be provided with active or passive space-cooling systems capable of maintaining an indoor temperature of 75° F on the design day. Wall mounted and window mounted cooling units used to comply with this section shall not obstruct any required emergency escape and rescue openings.

Reason: Section 309 addresses the requirements for space heating in interior spaces and requires that the system be able to maintain a temperature of at least 68 degrees. This is considered to be necessary to make the space occupiable. However, the code does not have any cooling requirements for hospitals, operating rooms, health care facilities, nursing homes, etc. In warm humid climates, space cooling can become a life safety issue for some members of society. This is not about luxury; rather, it can be the difference between life and death.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M35-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

309.2(NEW)-M-STRAUSBAUGH-PMGCAC.DOC

M36-12

401.2, Table 403.3; 407 (New); Chapter 15, IBC 1203.1

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IMC

Revise as follows:

Section 401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1,000 FT^2 [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^2 [a]	EXHAUST AIRFLOW RATE CFM/ FT^2 [a]
Food and Beverage Service				
Bars, cocktail lounges	100	7.5	0.18	--
Cafeteria, fast food	100	7.5	0.18	--
Dining rooms	70	7.5	0.18	--
Kitchens (cooking) [b]	--	--	--	0.7
~~**Hospitals, Nursing and convalescent homes**~~				
~~Autopsy rooms [b]~~	~~--~~	~~--~~	~~--~~	~~0.5~~
~~Medical procedure rooms~~	~~20~~	~~15~~	~~--~~	~~--~~
~~Operating rooms~~	~~20~~	~~30~~	~~--~~	~~--~~
~~Patient rooms~~	~~10~~	~~25~~	~~--~~	~~--~~
~~Physical therapy~~	~~20~~	~~15~~	~~--~~	~~--~~
~~Recovery and ICU~~	~~20~~	~~15~~	~~--~~	~~--~~
Hotels, motels, resorts and dormitories				
Multipurpose assembly		5	0.06	--
Bathrooms/toilets-private[g]		--	--	25/50[f]

(Portions of table and footnotes not shown remain unchanged)

Add new text as follows:

SECTION 407
AMBULATORY CARE FACILITIES AND GROUP I-2 OCCUPANCIES

Section 407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170.

Add new referenced standard to Chapter 15:

ASHRAE

Standard Reference Number	Title	Referenced in code section number
<u>170-2008</u>	<u>Ventilation of Health Care Facilities (with addendums a through h – 2011)</u>	<u>407.1</u>

PART II- IBC GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*. Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*. <u>Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the *International Mechanical Code.*</u>

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx. This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Currently Table 403.3 if the IMC has a limited number of spaces identified with ventilation rates, additionally if a room is not identified in the table then one is required to use the ventilation rate of an adjacent room that is on the list which is problematic if the space usage is vastly different. ASHRAE Standard 170, Table 7-1 has more comprehensive in the spaces that are identified as well as the design parameter requirements. Facility Guidelines Institute (FGI) has also incorporated ASHRAE 170 into the ventilation design requirements at health care facilities. ASHRAE 170 is similar in nature to the IMC referenced standard for the International Institute for Ammonia Refrigeration.

Cost Impact: The code change proposal should not increase the cost of construction because compliance with the standard is already required by facility licensure requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASHRAE170-2008] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M36-12

PART I – INTERNATIONAL MECHANICAL CODE

Public Hearing: Committee:	AS	AM		D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE

Public Hearing: Committee:	AS	AM		D
	Assembly:	ASF	AMF	DF

401.2-M-WILLIAMS-ADHOCHEALTHCARE.DOC

M37–12
401.2, Chapter 15, IBC 1203.1, IBC CHAPTER 35

Proponent: Steve Ferguson representing the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE INTERNATIONAL MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES, SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I - IMC

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403~~. R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with addendum j of ASHRAE Standard 62.2.

Add standard to Chapter 15 as follows:

ASHRAE Standard 62.2-10
Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

PART II – IBC-GENERAL

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code.* ~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*.~~ R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with addendum j of ASHRAE Standard 62.2.

Add referenced standard to Chapter 35 as follows:

ASHRAE Standard 62.2-10
Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: The previous requirements in the IMC were based on requirements in ASHRAE Standard 62.2.-2007. Since that time, the mechanical ventilation requirements in ASHRAE Standard 62.2 in R-2, R-3, and R-4 buildings have changed. This proposes to reference ASHRAE Standard 62.2 for ventilation requirements in these building types.
The changes in addendum j to 62.2-2010 account for unique features of multifamily buildings as compared to single-family buildings and include (1) adjusting the whole-building ventilation rate due to the fact that infiltration cannot be relied on for individual units in multifamily buildings; (2) provision of ventilation to common spaces and common parking garages, which do not exist in single-family buildings; and (3) prevention of contaminant transfer from other units through walls or ducts.

Cost Impact: There is no expected increase to the cost of construction, as this is simply a clarification of existing requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASHRAE 62.2-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M37-12

PART I-INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II-INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.2-M-FERGUSON.DOC

M38–12
401.2, 401.3 (NEW), IBC 1203.1

Proponent: Craig Conner, representing self.

BOTH PARTS I AND II OF THIS CODE CHANGE WILL BE HEARD BY THE IMC COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Part I – IMC

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door with a pressure of 0.2 inc W.C. (50 Pa) in accordance with Section 402.4.1.2~~ Where a dwelling unit complies with the air tightness requirements in Section C402.4.1 or R402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

Add new text as follows:

401.3 Backdrafting elimination. Dwelling units that comply with the air tightness requirements in Section C402.4.1 or R402.4.1.2 of the *International Energy Conservation Code*, shall comply with at least one of the following options:

1) Space heating appliances, boilers, water heating appliances, wood stoves, and fireplaces in the conditioned space of the dwelling unit shall be of the direct-vent, induced-draft, or power-vented type.

2) Mechanical ventilation for the conditioned space, exhaust systems, clothes dryers and central vacuum systems shall not contribute to depressurization. Systems that provide *makeup air* at a rate approximately equal to or greater than the *exhaust air* rate, that are equipped with a means of closure, and that are automatically controlled to start and operate simultaneously with the exhaust system shall not be deemed to contribute to depressurization.

3) Testing demonstrates compliance with the CAN/CGSB 51.71-2005 depressurization test. Where required by the *code official,* testing shall be performed by an *approved* third party.

4) The *registered design professional* demonstrates in an approved manner that backdrafting will not occur.

Part II – IBC-GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*.

Dwelling units that comply with the air tightness requirements in Section C402.4.1 or R402.4.1.2 of the *International Energy Conservation Code*, ~~Where the air infiltration in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door with a pressure of 0.2 inc W.C. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit~~ shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code.*

Add new standard to Chapter 15 as follows:

<u>CAN/CGSB 51.71-2005 Depressurization Test</u>

Reason: Backdrafting combustion appliances can lead to serious health consequences, occasionally including death. This change is designed to greatly reduce the likelihood of backdrafting. This change is also intended to remove the apparent requirement to apply a residential air tightness test to commercial spaces, and remove redundancy in the IBC and IMC.

The 2012 I-codes and common practices are increasing the potential for backdrafting in dwelling units. Back drafting is most likely if three things are true- construction is airtight, exhaust-only ventilation is used, and atmospherically vented (natural draft) combustion appliances are in conditioned spaces. New construction is required by the 2012 IECC to be much more airtight (C402.4.1 for commercial, R402.4.1.2 for residential). Mechanical ventilation is required by the 2012 I-codes in dwelling units, with the least expensive form of mechanical ventilation being the exhaust-only ventilation fans already in common use. The energy code no longer encourages more efficient condensing furnaces by recognizing their high energy efficiency; thereby, removing some of the motivation for condensing furnaces. The trend towards large exhaust fans, such as kitchen hoods, also contributes to the problem. This combination is a recipe for back drafting problems.

The proposed change gives several options. The first two options prevent back drafting by eliminating at least one of major contributor, either the natural draft (atmospherically vented) combustion appliances, or exhaust-only ventilation. The third option is a "Depressurization Test" (standard CAN/CGSB 51.71-2005), which tests for excessive depressurization levels in dwelling units. If a vented combustion appliance using combustion air from the conditioned space experiences strong enough depressurization, the flue gases will spill into the home. Anything more than a brief reverse flow can be serious. The fourth option could be used in situations where the registered design professional can show backdrafting is not a problem without doing a full depressurization test.

Confusion on when the 2012 IBC and IMC require mechanical ventilation in dwelling units is corrected by this change. The IBC and IMC partially, but not completely, repeat air tightness requirements from the IECC. The existing IBC and IMC can be read to require the residential criteria be applied to portions of commercial buildings, whereas the commercial portion of the IECC has its own air tightness criteria. Does a new dwelling unit in a commercial building that meets the 2012 IECC commercial air tightness requirements also require mechanical ventilation? In the 2012 IBC and IMC the answer is unclear unless the residential test is also performed, a test which may be difficult for some commercial buildings. Dwelling units which meet the relatively air tight 2012 IECC commercial criteria should require mechanical ventilation. This proposed change clarifies the IBC and IMC by simply referencing the IECC for air tightness requirements.

Cost Impact: This code change proposal will increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [CAN/CGSB 51.71-2005] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M38-12

PART I – INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.2-M-CONNER.DOC

M39–12
401.2, IBC 1203.1

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone (mmoore@newportpartnersllc.com)

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE

PART I – IMC

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section 402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403~~. R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with Section 403.

PART II – IBC GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*. ~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code.*~~ R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code.*

Reason: To identify the mechanical ventilation requirements of dwelling units, designers are now required to cross reference the 2012 IECC, determine if the dwelling unit is within a building that is covered within the scope of Chapter 4 or Chapter 5 of the IECC, and then determine if the air tightness level of the unit is sufficiently tight to require mechanical ventilation per Section 401.2 of the IMC.

This proposal short cuts this burdensome circuit by clearly stating what the designer would find if he or she were to go through this exercise – that mechanical ventilation is required by the overlap of the 2012 IECC and 2012 IMC for R-2, R-3, and R-4 buildings. The reason for this is as follows:

1. The 2012 IMC 401.2 requires dwelling units with an air infiltration rate less than 5 ACH 50 (air changes per hour at 50 Pa, as confirmed by a blower door test in accordance with 2012 IECC Section 402.4.1.2) to be provided with mechanical ventilation.
2. The scope of Chapter 4 of the 2012 IECC overlaps with that of the IMC for R-2, R-3, and R-4 buildings three stories or less above grade plane (see the definition of Residential within Chapter 2 of the IECC).
3. 2012 IECC 402.4.1.2 requires that the air leakage rate for all buildings or dwelling units within its scope be less than or equal to 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa).
4. The net result is that R-2, R-3, and R-4 buildings three stories or less in height above grade plane are required to be ventilated by mechanical means in accordance with Section 403 of the IMC.
5. Additionally, 2012 IECC 403.5 reads: "Mechanical Ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the International Residential Code or International Mechanical Code, as applicable, or with other approved means of ventilation."

Combined, the overlap of the two codes requires that mechanical ventilation should be provided in accordance with Section 403. This proposal is needed to clarify this requirement and remove ambiguity in the code. Note that there is a companion code change proposed for Section 1203.1 of the IBC.

Cost Impact: There is no expected increase to the cost of construction, as this is simply a clarification of existing requirements.

M39-12
PART I – INTERNATIONAL MECHANICAL CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – INTERNATIONAL BUILDING CODE

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.2-M-MOORE.DOC

M40–12
401.2.1 NEW

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

401.2 .1 Dwelling unit mechanical ventilation. The mechanical ventilation required for dwelling units by Section 401.2 shall be provided by means of one or more supply or exhaust fans or one or more local supply or exhaust fans. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation where utilized in conjunction with exhaust fans.

Reason: Section 401.2 requires mechanical ventilation in dwelling units under specified conditions, but unlike the IRC, it does not provide any guidance as to how this is to be accomplished. The proposed text is borrowed from the IRC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M40-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.2.1-M-STRAUSBAUGH-PMGCAC.DOC

M41–12
401.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

401.3 When required. Ventilation shall be provided during the periods that the room or space is occupied. <u>Continuous mechanical ventilation shall be provided for swimming pool areas.</u>

Reason: As is typical, there is high humidity and an accumulation of chemicals in the air of enclosed spaces involving swimming pools. Without continuous air movement and air exchange, the humidity has been known to promote the growth of mold within the space. Additionally, due to chemicals commonly used to treat pool water, corrosion to exposed metals in such spaces have been known to occur where air movement and air exchange is not maintained.

Cost Impact: There would be an increase operational costs as associated with supply & exhaust fan operations and the need for additional tempered outside air as associated with IMC 403.2.1 Item 2. and IMC Table 403.3. Such costs are dependent on the size of the pool & deck.

M41-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

401.3-M-DAHMEN.DOC

M42–12
403, 403.3(NEW), 403.3.1 (NEW), 403.3.2(NEW), 403.3.2.1(NEW), 403.3.2.1.1(NEW), 403.3.2.2(NEW), 403.3.2.3(NEW), 403.3.2.4(NEW)

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone (mmoore@newportpartnersllc.com)

Revise as follows:

403.1 Ventilation system. Except as required by Section 403.1.1, mechanical ventilation shall be provided by a method of supply air and return or exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

403.1.1 R-2, R-3 and R-4 occupancies. Mechanical ventilation air requirements for R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be provided by an exhaust system, supply system, or combination thereof.

403.2 Outdoor air required. The minimum outdoor airflow rate shall be determined in accordance with Section 403.3. ~~Ventilation supply systems shall be designed to deliver the required rate of outdoor airflow to the breathing zone within each occupiable space.~~

> **Exception:** Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

403.2.1 Recirculation of air. The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3.1.1, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.1.1.
4. Where mechanical exhaust is required by Note g in Table 403.3.1.1, mechanical exhaust is required and recirculation is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.

403.2.2 Transfer air. Except where recirculation from such spaces is prohibited by Table 403.3.1.1, air transferred from occupiable spaces is not prohibited from serving as makeup air for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators and smoking lounges. The amount of transfer air and exhaust air shall be sufficient to provide the flow rates as specified in Section 403.3.1.1. The required outdoor airflow rates specified in Table 403.3.1.1 shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

In R-2, R-3, and R-4 occupancies three stories or less in height, measures shall be taken to minimize air movement across envelope components separating dwelling units including sealing penetrations in the common walls, ceilings, and floors of each unit, and by sealing vertical chases adjacent to the units. Doors between dwelling units and common hallways shall be gasketed or otherwise made airtight.

403.3 Outdoor air and local exhaust airflow rates. R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be provided with outdoor air and local exhaust in accordance with Section 403.3.2. All other buildings intended to be occupied shall be provided with outdoor air and local exhaust, in accordance with Section 403.3.1.

403.3.1 Other buildings intended to be occupied. The design of local exhaust systems and ventilation systems for outdoor air for occupancies other than R-2, R-3 and R-4 three stories are less above grade plane, shall comply with this section.

~~403.3~~403.3.1.1 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate, determined in accordance with this section. Ventilation supply systems shall be designed to deliver the required rate of outdoor airflow to the breathing zone within each occupiable space. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3.1.1. Ventilation rates for occupancies not represented in Table 403.3.1.1 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

With the exception of smoking lounges, the ventilation rates in Table 403.3.1.1 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3.1.1 in accordance with accepted engineering practice.

> **Exception:** The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3.1.1 where approved statistical data document the accuracy of an alternate anticipated occupant density.

(Renumber current sections as indicated in table)

Old Section Numbering	New Section Numbering	Section Heading
403.3	403.3.1.1	Outdoor airflow rate
403.3.1	403.3.1.1.1	Zone outdoor airflow
403.3.1.1	403.3.1.1.1.1	Breathing zone outdoor airflow
403.3.1.2	403.3.1.1.1.2	Zone air distribution effectiveness
403.3.1.3	403.3.1.1.1.3	Zone outdoor airflow
403.3.2	403.3.1.1.2	System outdoor airflow
403.3.2.1	403.3.1.1.2.1	Single zone systems
403.3.2.2	403.3.1.1.2.2	100-percent outdoor air systems
403.3.2.3	403.3.1.1.2.3	Multiple zone recirculating systems
403.3.2.3.1	403.3.1.1.2.3.1	Primary outdoor air fraction
403.3.2.3.2	403.3.1.1.2.3.2	System ventilation efficiency
403.3.2.3.3	403.3.1.1.2.3.3	Uncorrected outdoor air intake
403.3.2.3.4	403.3.1.1.2.3.4	Outdoor air intake flow rate
403.4	403.3.1.2	Exhaust ventilation
403.5	403.3.1.3	System operation
403.6	403.3.1.4	Variable air volume system control
403.7	403.3.1.5	Balancing

403.3.2 R-2, R-3, and R-4 buildings three stories or less in height above grade plane. The design of local exhaust systems and ventilation systems for outdoor air in R-2, R-3, and R-4 occupancies three stories and less in height above grade plane shall comply with sections 403.3.2.1 through 403.3.2.4.

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system, or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate is specified in Equation 4-1.

$Q_{OA} = 0.03A_{floor} + 7.5(N_{br} + 1)$ (**Equation 4-1**)

where

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

> **Exception:** The outdoor air ventilation system shall be permitted to be designed to operate intermittently where the system has controls that enable operation for not less than 25-percent of each 4-hour segment and the outdoor airflow rate prescribed by Equation 4-1 is multiplied by the factor determined in accordance with Table 403.3.2.1. This factor shall be applied after the outdoor airflow rate is adjusted for occupant density in accordance with Section 403.3.2.1.1.

TABLE 403.3.2.1
INTERMITTENT OUTDOOR AIR RATE FACTORS[a,b]

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

403.3.2.1.1 Occupant density. Equation 4-1 assumes that there are two occupants in a studio or one-bedroom dwelling unit and an additional occupant for each additional bedroom. Where higher occupant densities are known, the outdoor airflow rate shall be increased by 7.5 cfm for each additional occupant. Lower occupant densities shall not be used except where approved by the code official.

403.3.2.2 Outdoor air for other spaces. Corridors and other common areas within the conditioned space shall be provided with outdoor air at a rate of not less than 0.06 cfm per ft^2 of floor area.

403.3.2.3 Local exhaust. Local exhaust systems shall be provided in kitchens, bathrooms, and toilet rooms, and shall have the capacity to exhaust the minimum airflow rate determined in accordance with Table 403.3.2.3.

TABLE 403.3.2.3
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR R-2, R-3, AND R-4 OCCUPANCIES

AREA TO BE EXHAUSTED	EXHAUST RATE CAPACITY
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	50 cfm intermittent or 20 cfm continuous

403.3.2.4. System controls. Local exhaust systems and ventilation systems for outdoor air shall be provided with controls that enable manual override.

Reason: Historically, the basis of the mechanical ventilation requirements for all buildings within the scope of the IMC has been ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality. However, the scope of ASHRAE Standard 62.1 does not address R-2, R-3, and R-4 buildings with a height of three stories or less above grade plane. Instead, mechanical ventilation requirements for these buildings fall under the scope of ASHRAE Standard 62.2, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*. This proposal seeks to align the mechanical ventilation requirements for R-2, R-3, and R-4 buildings of three stories or less above grade plane with the latest requirements of ASHRAE 62.2, while retaining common elements with the 2012 IRC mechanical ventilation requirements in Section M1507 wherever possible (e.g., Table 403.3.2.3 is the same as M1507.4; Table 403.3.2.1 is the same as M1507.3.3(2)).

This proposal makes no changes to the mechanical ventilation requirements of buildings other than R-2, R-3, and R-4 buildings of three stories or less above grade plane (note that the text removed from 403.2 has simply been reinserted in 403.3.1.1).

The effect of this proposal will be to simplify and clarify mechanical ventilation requirements for R-2, R-3, and R-4 buildings with a height of three stories or less above grade plane, ensuring that the IMC requirements are aligned with the latest ASHRAE standard that addresses these building types. Note that the latest ASHRAE 62.2 requirements addressing R-2, R-3, and R-4 buildings are found in addendum j to the 2010 edition. To receive a complimentary copy of addendum j, contact ASHRAE at (404) 636-8400.

Cost Impact: There is no expected increase to the cost of construction.

M42-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.1-M-MOORE.DOC

M43–12
403.2.1, Table 403.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. Where recirculation of air is prohibited, ~~A~~all air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

(Portions not shown remain unchanged)

Revise footnote as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. (see Section 403.2.1, Item 3).

Reason: The language used in these sections is accurate, yet weak. The intent is commonly being misinterpreted, resulting in a requirement of 100% outdoor air systems to all spaces applicable to footnote b. This type of misinterpretation would not allow for the installation of a mini-split type room air conditioner or even a ceiling mounted paddle fan because both would recirculate air within the space. This is not the intent of this requirement. The intent of these sections is to prohibit air that is delivered to a space, such as a beauty salon or a repair garage, from being taken out of that space and delivered to another, unrelated space such as a dining room or a classroom or an operating room. Where a space is provided with an air distribution system dedicated to such space, the air delivered to that space cannot possibly be distributed to other, unrelated spaces, therefore recirculation “from” such spaces is not possible. The outdoor air and exhaust requirements for spaces subject to this footnote effectively remove the contaminants generated within such spaces, therefore air provided to such spaces that is in excess of that required by Table 403.3 may safely be recirculated *within* such spaces.

Cost Impact: The code change proposal will not increase the cost of construction.

M43-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.2.1#1-M-GRACE.DOC

M44–12
403.2.1, Table 403.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

(No changes to items 1 through 3)

4. Where mechanical exhaust is required by Note g in Table 403.3, mechanical exhaust is required and recirculation <u>from such spaces</u> is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. <u>Recirculation of air that is contained completely within such spaces shall not be prohibited.</u>

TABLE 403.3
MINIMUM VENTILATION RATES

g. Mechanical exhaust is required and recirculation <u>from such spaces</u> is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces<u>. Recirculation of air that is contained completely within such spaces shall not be prohibited.</u> (see Section 403.2.1, Items 2 and 4).

(Portions of table and footnotes not shown remain unchanged)

Reason: Unlike footnote b (Table 403.3), footnote g *does* allow for recirculation of air *from* such a space to another space. The purpose of footnote g was to encourage the use of heat recovery systems in air handling units and exhaust systems that served bathrooms, toilet rooms, locker rooms, and the like. For this reason, recirculation of air, from these spaces to other spaces, is limited. That limitation allowed for a small amount of leakage from the exhaust to the supply by the energy recovery units. Where energy recovery units are not used, meeting this requirement would be rare, where this requirement is applicable. The intent of this section is being misinterpreted, resulting in a requirement of 100% outdoor air systems where dedicated air handling units are being specified for such spaces. Where a space is provided with an air distribution system dedicated to such space, the air delivered to that space cannot possibly be distributed to other, unrelated spaces, therefore recirculation “from” such spaces is not possible. The outdoor air and exhaust requirements for spaces subject to this footnote effectively remove the contaminants generated within such spaces, therefore air provided to such spaces that is in excess of that required by Table 403.3 may safely be recirculated *within* such spaces, regardless of the percentage of the resulting supply airstream.

Cost Impact: The code change proposal will not increase the cost of construction.

M44-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.2.1#2-M-GRACE.DOC

M45–12
Table 403.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself.

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2a}	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2a}	EXHAUST AIRFLOW RATE CFM/FT^{2a}
Storage				
Repair garages, enclosed parking garages and aircraft hangars[b,d]	—	—	—	0.75

(Portions of table not shown remain unchanged.)

Reason: Enclosed parking garages have typically been viewed as a space in which automotive vehicles are to be located. The application of “enclosed parking garage” has been called into question when examining its application for use with aircraft hangars. The intent of the change is to provide clarity that the code entry involving a minimum exhaust rate is also applicable to aircraft hangars.

Cost Impact: The code change proposal will not increase the cost of construction.

M45-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.3#1-M-DAHMENDOC.DOC

M46–12
Table 403.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association and Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

h. For nail salons, each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. <u>Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3 for the nail salon.</u>

(Portions of table and footnotes not shown remain unchanged.)

Reasons:
Grace-The exhaust rate in the Table was established before the requirement for source capture systems was required. It's punitive to add more exhaust when the original amount was sufficient. It's not the intent for the source capture system flow rate to be in addition to the general exhaust requirement when it runs continuously as most of the vapors are being contained at the source. The balance of exhaust required will cover any fugitive vapors that may slip by the station exhaust system. If for instance there are individually controlled fans at each station, then that amount of exhaust would be in addition to the general amount because there is no guarantee that the fans will be used.

McMann-Currently the code is silent on how to apply both the general exhaust column and note h of Table 403.3 The exhaust rate in the Table was established before the requirement for source capture systems were required. It's punitive to add more exhaust when the original amount was sufficient. It's not the intent for the source capture system flow rate to be in addition to the general exhaust requirement when it runs continuously during occupancy as most of the chemical vapors are being contained at the source. The balance of exhaust required will cover any fugitive vapors that may slip by the station exhaust system. If for instance there are individually controlled fans at each station, then that amount of exhaust would be in addition to the general amount because there is no guarantee they will be operated. As an example, if the salon is required to have 800 cfm of general exhaust by Table 403.3 and 6 nail stations exhaust the required minimum of 300 cfm continuously, the general exhaust could be reduced to 500 cfm. The intent of the code is met because a total of 800 cfm is still being exhausted and the vapors are still being captured at their source.

Cost Impact: None

M46-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403#1-M-GRACE-MCMANN.DOC

M47-12/13
Table 403.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *Rp* CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHIN ZONE, *Ra* CFM/FT2	DEFAULT OCCUPANT DENSITY #/1000 FT2	EXHAUST AIRFLOW RATE CFM/FT2
Hospitals~~,~~ and nursing ~~and convalescent~~ homes [j] Autopsy rooms[b] Medical procedure rooms Operating rooms Patient rooms Physical therapy Recovery and ICU				

(Portions of table and notes not shown remain unchanged)

Reason: The term 'convalescent home' is currently being used incorrectly in IMC Table 403.3 as a Group I-2 facility. These facilities are currently listed as Group I-1 and R-4, therefore the requirements listed in the ventilation tables are not correct. In addition, there is a correlative change to delete this term from Group I-1 and R-4 as an outdated term.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

M47-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.3-M-BALDASSARRA-CTC.DOC

M48–12
Table 403.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT[2a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT[2a]	EXHAUST AIRFLOW RATE CFM/FT[2a]
Specialty shops				
Vehicle wash area[b]	—	—	—	0.75

(Portions of table not shown remain unchanged.)

Reason: Vehicle wash areas which occur in enclosed spaces retain large amounts of humidity. Such areas also include exhausts from the motorized vehicles such as cars, trucks, etc. from when the vehicles were moved into the space. By exhausting the space during occupancy, both the humidity and the vehicle exhausts would be removed. Additionally, contaminants from the vehicle wash which may permeate the air will also be removed.

Cost Impact: The code change proposal will not increase the cost of construction.

M48-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.3#2-M-DAHMEN.DOC

M49–12
T403.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) and Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association (gmcmann@jeffco.us)

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT^{2} [a]
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
~~Garages, separate for each dwelling[b]~~	—	—	—	~~100 cfm per car~~
Kitchens[b]	—	—	—	25/100[f]
Living areas[c]	— Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	— 0.35 ACH but not less than 15 cfm/person	— —	—
Toilet rooms and bathrooms[g]	—	—		20/50[f]

(Portions of table not shown remain unchanged.)

Reason:

McMann-The requirement for an exhaust system which is a form of ventilation seems to conflict with Section 502.14 which exempts one and two family dwellings from being ventilated. The concern is installing a fan of this size will have no impact on the garage space as it would not provide much in the way of flow. There are very few if any jurisdictions enforcing a fan in a residential garage. There is no technical justification to require this provision because simply opening the door when a car leaves will provide more ventilation than any fan of this size would even if the garage has no windows and certainly makeup air could technically come into play which isn't practical either.

Grace-This is in direct conflict with Section 502.14 Exception # 2 which exempts one and two family dwellings. This makes no sense as there are no values to supply a garage with ventilation air and installing a fan of this size will have no impact on the garage space as it would not provide much in the way of flow. There are few if any jurisdictions enforcing a fan in a residential garage. There is no technical justification to require this provision because simply opening the door when a car leaves will provide more ventilation than any fan would and certainly makeup air would come into play which isn't practical either.

Cost Impact: This could *decrease* the cost of construction**.**

M49-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T403.3#1-M-MCMANN.DOC

M50– 12
403

Proponent: Steve Ferguson representing the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Revise as follows:

403.3.1.1 Breathing zone outdoor airflow. The outdoor airflow rate required in the *breathing zone* (Vbz) of the occupiable space or spaces in a zone shall be not less than the value determined in accordance with Equation 4-1.

$Vbz = RpPz + RaAz$ (Equation 4-1)

Where:

Az = zone floor area: the net occupiable floor area of the space or spaces in the zone.
Pz = zone population: the number of people in the space or spaces in the zone as determined by Section 403.3.1.4.
Rp = people outdoor air rate: the outdoor airflow rate required per person from Table 403.3
Ra = area outdoor air rate: the outdoor airflow rate required per unit area from Table 403.3

403.3.1.2 Zone air distribution effectiveness. The *zone air distribution effectiveness* (*Ez*) shall be not greater than the value determined using Table 403.3.1.2.

403.3.1.4 Design Zone Population. Design *zone population (Pz)* shall equal the largest (peak) number of people expected to occupy the *ventilation zone* during typical usage.

Exceptions:

1. Where the number of people expected to occupy the *ventilation zone* fluctuates, a *zone population* equal to the average number of people shall be permitted to be used,
2. Where the largest or average number of people expected to occupy the *ventilation zone* cannot be established for a specific design, an estimated value for *zone population* shall be permitted to be used, provided that such value is the product of the *net occupiable area* of the *ventilation zone* and the occupant density listed in Table 403.3.

403.3.2 System outdoor airflow. The outdoor air required to be supplied by each ventilation system shall be determined in accordance with Section 403.3.2.1 through 403.2.3 as a function of system type and zone outdoor airflow rates.

403.3.2.1 Single zone systems. ~~When~~ For *ventilation* systems wherein one or more air handler supplies a mixture of outdoor air and recirculated return air to only one zone, the system *outdoor air intake flow rate* (*Vot*) shall be determined in accordance with Equation 4-3.

$Vot = Voz$ (Equation 4-3)

403.3.2.2 100% outdoor air systems. ~~When~~ For *ventilation* systems wherein one or more air handler supplies only outdoor air to one or more zones, the system *outdoor air intake flow* rate (*Vot*) shall be determined using Equation 4-4.

$Vot = \Sigma all\ zones Voz$ (Equation 4-4)

403.3.2.3 Multiple zone recirculating systems. Where one air handler supplies a mixture of outdoor air and recirculated return air to more than one zone, the system outdoor air intake flow rate (*Vot*) shall be determined
in accordance with Sections 403.3.2.3.1 through 403.3.2.3.4.

$Z_p = Voz/ Vpz$ (Equation 4-5)

Where

Vpz = Primary airflow: The airflow rate supplied to the zone from the air-handling unit at which the outdoor air intake is located. It includes outdoor intake air and recirculated air from that air-handling unit but does not include air transferred or air recirculated to the zone by other means. For design purposes, *Vpz* shall be the zone design primary
airflow rate, except for zones with variable air volume supply and *Vpz* shall be the lowest expected primary airflow rate to the zone when it is fully occupied.

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^2 [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^2 [a]	EXHAUST AIRFLOW RATE CFM/FT^2 [a]
Correctional facilities				
Cells without plumbing fixtures	25	~~5~~10	0.12	—
with plumbing fixtures[g]	25	~~5~~10	0.12	1.0
Dining halls (see food and beverage service)	—	—	—	—
Guard stations	15	5	0.06	—
Day room	30	5	0.06	—
Booking/waiting	50	7.5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	~~0.06~~0.12	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	25	—	—
Storage, pick up	30	7.5	0.12	—
Education				
Auditoriums	150	5	0.06	—
Corridors (see public spaces)	—	—	~~—~~0.06	—
Media center	25	10	0.12	—
Sports locker rooms[g]	—	—	—	0.5
Music/theater/dance	35	10	0.06	—
Smoking lounges[b]	70	60		—
Day care (through age 4)	25	10	0.18	—

Classrooms (ages 5-8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Art classroom[g]	20	10	0.18	0.7
Science laboratories[g]	25	10	0.18	1.0
Wood/metal shops[g]	20	10	0.18	0.5
Computer lab	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Locker/dressing rooms[g]	—	—	—	0.25
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking)[b]	—20	—7.5	—0.12	0.7
Hospitals, nursing and convalescent homes				
Autopsy rooms[b]	—	—	—	0.5
Medical procedure rooms	20	15	—	—
Operating rooms	20	30	—	—
Patient rooms	10	25	—	—
Physical therapy	20	15	—	—
Recovery and ICU	20	15	—	—

(continued)

TABLE 403.3—continued MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT^{2} [a]
Hotels, motels, resorts and dormitories				
Multipurpose assembly	120	5	0.06	—
Bathrooms/toilet—private[g]		—	—	25/50[f]
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas		5	0.06	—
Gambling casinos	120	7.5	0.18	—
Lobbies/prefunction	120	7.5	0.06	—
Offices				
Conference rooms	50	5	0.06	—
Office spaces	5	5	0.06	—

Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Main entry lobbies	10	5	0.06	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Garages, separate for each dwelling[b]	—	—	—	100 cfm per car
Kitchens[b]	—	—	—	25/100[f]
Living areas[c]	Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms[g]	—	—	—	20/50[f]
Public spaces				
Corridors	—	—	0.06	—
Elevator car	—	—	—	1.0
Shower room (per shower head)[g]	—	—	—	50/20[f]
Smoking lounges[b]	70	60	—	—
Toilet rooms — public[g]	—	—	—	50/70[e]
Places of religious worship	120	5	0.06	—
Courtrooms	70	5	0.06	—
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Retail stores, sales floors and showroom floors				
Sales (except as below)	15	7.5	0.12	—
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Shipping and receiving	—2	—10	0.12	—
Smoking lounges[b]	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see storage)	—	—10	—0.06	—

TABLE 403.3—continued
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^2 [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^2 [a]	EXHAUST AIRFLOW RATE CFM/FT^2 [a]
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Nail salons[b,h]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2.0
Pet shops (animal areas)[b]	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Disco/dance floors	100	20	0.06	—
Bowling alleys (seating areas)	40	10	0.12	—
Game arcades	20	7.5	0.18	—
Ice arenas without combustion engines	—	—	0.30	0.5
Gym, stadium, arena (play area)	—	—	0.30	—
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Storage				
Repair garages, enclosed parking garages[b,d]	—	—	—	0.75
Warehouses	—	—10	0.06	—
Theaters				
Auditoriums (see education)	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Darkrooms	—	—	—	1.0

Copy, printing rooms	4	5	0.06	0.5
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Computer (without printing)	4	5	0.06	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) - 32]/1.8, 1 square foot = 0.0929 m^2.

a. Based upon *net occupiable floor area*.
b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).
c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
d. Ventilation systems in enclosed parking garages shall comply with Section 404.
e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
g. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces (see Section 403.2.1, Items 2 and 4).
h. For nail salons, each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station.

Reason: The current ventilation criteria in the IMC are essentially based on ASHRAE Standard 62-2007. Research has been conducted since then our knowledge of indoor air quality and ventilation has evolved. In response to these actions ASHRAE has enhanced Standard 62.1, upon which the IMC is based. This code change would make the IMC consistent with ventilation rate procedures defined in ANSI/ASHRAE Standard 62.1-2010.

Substantiation: ANSI/ASHRAE Standard 62.1-2010 is a consensus national standard. Standard 62.1 ventilation rate calculation procedure has been substantially updated in the 2010 version to reflect the latest research on building indoor air quality. The procedure now requires designers to account for pollutant sources other than occupants, such as building materials and furnishings, and to account for the efficiency of the ventilation system to deliver outdoor air to the breathing zone. Ventilation systems designed using the new procedures will result in slightly lower outdoor rates for most occupancies compared to the current code, reducing first costs and energy costs.

Cost Impact: The code change proposal will not increase the cost of construction, and in some instances will reduce the first cost of construction. Engineering design effort and jurisdictional plan review processes will not be materially affected due to the availability and greater specificity of compliance tools.

M50-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.3.1.1-M-FERGUSON.DOC

M51–12
403.2

Proponent: Maureen Traxler/City of Seattle Dept of Planning & Development/ City of Seattle Dept of Planning & Development
(maureen.traxler@seattle.gov)

Revise as follows:

403.2 Outdoor air required. The minimum outdoor airflow rate shall be determined in accordance with Section 403.3. ~~Ventilation~~ In occupiable spaces, the ventilation supply system~~s~~ shall be designed to deliver the required rate of outdoor airflow to the *breathing zone* ~~within each *occupiable space*~~.

> **Exception:** Where the *registered design professional* demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

Reason: The purpose of this proposal is to make an editorial clarification. As currently worded, the provision has caused confusion that ventilation systems are only required for occupiable spaces. The purpose of the second sentence of Section 403.2 is to require that the outdoor airflow be directed to the breathing zone—a requirement that is only applicable in occupiable spaces because, according to the definition, "breathing zones" only occur in occupied spaces. The first sentence establishes the general requirement that minimum rates of outdoor air are required in all the locations specified in Table 403.3; as written, the second sentence causes some confusion that the outdoor air is only required for occupiable spaces. This proposal clarifies the meaning of the section without changing its impact.

Cost Impact: The code change proposal will not increase the cost of construction.

M51-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.2-M-TRAXLER.DOC

M52–12
403.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

403.4 Exhaust ventilation. Exhaust airflow rate shall be provided in accordance with the requirements in Table 403.3. Where Table 403.3 specifies a people outdoor airflow rate, an area outdoor airflow rate, or both for an occupancy that also has an exhaust airflow rate specified by Table 403.3, the space served by the required exhaust airflow shall be supplied with outdoor air at a rate not less than that determined in accordance with Section 403.3 and such outdoor air shall be either a component of the makeup air for the required exhaust airflow or it shall be otherwise relieved or exhausted. Exhaust *makeup air* shall be permitted to be any combination of outdoor air, recirculated air and transfer air provided that the outdoor air requirements of Table 403.3 are satisfied ~~except as limited in accordance with Section 403.2~~.

Reason: Consistent with the intent of ASHRAE 62.1, the exhaust rate prescribed by the last (far right) column of Table 403.3 is NOT applied in addition to the rate determined from the other columns. Note that the exhaust column rate will almost always be greater than the rate determined from the other columns, therefore, the exhaust rate column rules. For example, see table entries for cells with plumbing, wood shops, science labs, barber shops, ice arenas and copy rooms. This raises the question of why are there numbers in the first 3 columns if they are overridden by the exhaust column. According to ASHRAE, the reason is to make sure that at least that much outdoor air is introduced into the space as makeup air for the exhaust system, with the rest of the makeup air being transfer air from other spaces. For example, assume a standalone barber shop of 1000 sq ft with a single zone and assume a zone effectiveness (E_z) of 1. So, 0.5 times 1000 = 500 CFM for the exhaust column. For the other columns, 7.5 times 25 occupants = 188CFM and 0.06 times 1000 = 60 CFM; 60 plus 188 = 248 CFM which is less than 500. The intent is that 500CFM is the required ventilation rate for the shop and the makeup air has to be composed of at least 248 CFM of outdoor air and the remainder of 252 CFM can be transfer air or outdoor air. Now that it can be seen how this is supposed to work, it is apparent that Section 403.4 fails to explain this. The code user would have no idea based on current text.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M52-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

403.4-M-STRAUSBAUGH.PMGCAC.DOC

M53–12
404.1

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

404.1 Enclosed parking garages. Where mechanical ventilation systems for enclosed parking garages ~~shall be permitted to~~ operate intermittently, such systems shall be in accordance with Item 1, 2 or both.

1. The system shall be arranged to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.
2. The system shall be arranged to operate automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Such detectors shall be installed in accordance with their manufacturers' recommendations. Additionally, the system shall operate at an exhaust rate of 0.75 cfm per square foot (0.0038 $m^3/s \cdot m^2$) of floor area for a total of 5 hours during any 24 consecutive hour period.

Reason: The operation of motion sensors in parking garages is very costly and energy inefficient. Initially the code just required carbon monoxide detectors and there was a concern about diesel emissions which would not be detected by the carbon monoxide detectors. Since that time, nitrogen dioxide detectors have been developed which will detect diesel emissions solving the concern about the increase of diesel powered vehicles in parking garages. Using both detectors has been the preferred option as an alternate method of addressing the problem.

The proposed additional language addressing the need for the system to operate 5 hrs per 24 hour period, is so that contaminants, other than those of carbon monoxide and nitrogen dioxide, that may be located within the garage enclosure, can be removed at regular intervals. The revision to the main section simply gets rid of permissive language.

Cost Impact: The code change proposal will not increase the cost of construction.

M53-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.1-M-DAHMEN.DOC

M54–12
404.1

Proponent: Don Davies, Salt Lake City Corp/Salt Lake County representing Utah Chapter of ICC, Brent Ursenbach, Utah Chapter of ICC (don.davies@slcgov.com) and Donald R. Monahan, PE, Walker Parking Consultants/Engineers, Inc. representing the Parking Consultants Council of the National Parking Association, Washington, DC (don.monahan@walkerparking.com)

Revise as follows:

404.1 Enclosed parking garages. Where mechanical ventilation systems for enclosed parking garages ~~shall be~~ ~~permitted to~~ operate intermittently, such operation shall be automatic ~~in accordance with Item 1, Item 2 or both.~~

~~1.~~ ~~The system shall be arranged to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.~~

~~2.~~ ~~The system shall be arranged to operate automatically~~ by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Such detectors shall be installed in accordance with their manufacturers' recommendations.

Reason: Enclosed parking garages require mechanical ventilation to safeguard the building occupants from emissions of high levels of carbon monoxide (CO) by cars and/or nitrogen dioxide (NO_2) from diesel engines. In most enclosed parking garages the operation of the ventilation system consumes the major portion of the total energy use of the facility. Reducing the energy use for ventilation while maintaining adequate indoor air quality can be achieved using demand ventilation control strategies. However permitting motion detectors to operate the ventilation system does not promote energy efficiency and will not provide optimum life safety protection for the following reasons:

- The mechanical ventilation system will run, unnecessarily, every time a vehicle or person moves even though the CO or NO_2 concentrations are within safe indoor air quality levels.
- Dangerous levels of CO and/or NO_2 from an idling vehicle will go undetected by motion detectors.

Whereas the mechanical ventilation system will only run when toxic gases present a threat to the safety of people, which is the most import purpose of a ventilation system. The revision to the main section simply gets rid of permissive language.

Cost Impact: There will be a significant savings in energy cost with approval of this proposal as follows:
Consider a 100,000 sf underground parking structure for about 350 parking spaces with a combined horsepower of all fans of approximately 75 HP. 75 HP X 746 Watts per HP = 55,950 watts or 55.95 kilowatts. Annual fan power consumption without gas detection = 12 hours per day X 365 days per year x 55.95 kW = 245,061 kWh. With gas detection demand control = 2 hours per day X 365 days X 55.95 kilowatts = 40,844 kWh. The annual savings is 204,217 kWh. At a U.S. average electric utility rate of $0.10 per kWh, the annual cost savings is $20,422.
(Source: "Demand Controlled Ventilation Cuts Energy Bills, Increases Patron Comfort", Parking Magazine by National Parking Association, March 2011.) In the 2000 ASHRAE Transactions, the paper "Evaluation of Design Ventilation Requirements for Enclosed Parking Facilities" by Ayari and Krarti indicated an energy savings of 17 to 46% with demand control ventilation strategies.

M54-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

404.1-M-DAVIES-MONAHAN-URSENBACH.DOC

M55–12
406.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Delete without substitution:

~~**406.1 General.** Uninhabited spaces, such as crawl spaces and attics, shall be provided with natural ventilation openings as required by the International Building Code or shall be provided with a mechanical exhaust and supply air system. The mechanical exhaust rate shall be not less than 0.02 cfm per square foot (0.00001 m3/s • m2) of horizontal area and shall be automatically controlled to operate when the relative humidity in the space served exceeds 60 percent.~~

Reason: The scoping statement for IMC Chapter 4, section 401.1, states that "This chapter shall govern the ventilation of spaces within a building intended to be occupied". Ventilation of unoccupied (uninhabited) spaces is a matter for the IBC to regulate and has no place in the IMC. Section 406 should be removed in its entirety.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M55-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

406.1-M-STRAUSBAUGH.PMGCAC.DOC

M56–12
202, 428 (NEW)

Proponent: Karen Hobbs, Natural Resources Defense Council, representing self (khobbs@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Add new definition as follows:

EVAPORATIVE COOLING SYSTEM. A system for cooling the air in a building or space by removing heat from the outdoor air by means of the evaporation of water. The system forces air through wet porous pads, causing the latent heat of evaporation to cool the air. Water is continuously circulated over the pads to replenish the evaporated water. Where the cooled air is sent directly into the building, the system is referred to as "direct evaporative cooling". Where the cooled air is sent through heat exchangers re-circulating indoor air, the system is referred to as "indirect evaporative cooling".

Add new text as follows:

SECTION 428
EVAPORATIVE COOLING SYSTEMS

428.1 Evaporative Cooling. Evaporative cooling systems shall utilize use less than 4 gallons of water per ton-hour of cooling when system controls are set to maximum water use. Water use, expressed in maximum water use per ton-hour of cooling, shall be marked on the device and included in product user manuals, product information literature and installation instructions. Water use information shall be readily available at the time of code compliance inspection.

428.1.1 Overflow Alarm. The evaporative cooling system shall be equipped with an overflow alarm to alert building owners, tenants or maintenance personnel when the water refill valve continues to allow water to flow into the reservoir when the reservoir is full. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of ten feet.

428.1.2 Automatic Pump Shut-off. The evaporative cooling system shall automatically cease pumping water to the evaporation pads when there is no demand for sensible heat reduction.

428.1.3 Cooler Reservoir Discharge. A water quality management system is required utilizing a timer or water quality sensor. Where timers are used, the time interval between periods of discharging of water from the reservoir shall be set for six hours or greater of cooler operation. Continuous discharge and continuous bleed systems are prohibited.

428.1.3.1 Discharge Water Reuse. Where a nonpotable water source system exists on site, evaporative cooler discharge water shall be collected and discharged to such collection system.

> **Exception:** Where the reservoir water will adversely affect the quality of the nonpotable water supply making the nonpotable water unusable for its intended purposes.

428.1.3.2 Discharge Water to Drain. Where discharge water is not required to be recovered for reuse, the sump overflow drain line shall discharge to an approved location. Drain lines shall not be directly connected to any drainage system. Where the discharge water is discharged into a sanitary drain, an air gap of not less than 6 inches is required between the termination of the discharge line and the drain opening. The drain line shall terminate in a location that is readily visible to the building owner, tenants or maintenance personnel.

Reason:

1. This proposal was approved by the IGCC in May, 2011, as submitted by the Alliance for Water Efficiency (AWE) and Natural Resources Defense Council (NRDC).
2. Evaporative coolers can waste large quantities of water. There is great variance in water efficiencies of different makes and models. Limiting systems to use less than 4 gallons of water per hour is a relatively low standard and should be easily met by most systems.
3. NRDC estimates that nationwide adoption of the revised values in this proposal, effective 2016, can be expected to save:
   - 19 million gallons of water per day by 2030;
   - 9.3 million kilowatt hours per year by 2030; and
   - Consumers will realize more than $27 million dollars in reduced electricity and water costs.
4. Faulty float valves can cause reservoirs to overflow, sending thousands of gallons of water into the wastewater line without the problem detected. Alarms are needed to alert the operator of this waste.
5. The discharge water is nonpotable, but of sufficient quality to be reused for other applications.
6. There are no known water use standards for these systems by AHRI or any other known organization.

Cost Impact: None

M56-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

428(NEW)-P-HOBBS.DOC

M57–12
501.3 (NEW), 501.4 (NEW)

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone (mmoore@newportpartnersllc.com)

Add new text as follows:

501.3 Common exhaust ducts for environmental air in dwelling units. A common exhaust duct shall not be used to convey environmental air from separate dwelling units unless a single fan designed and intended to run continuously is located downstream of the exhaust inlets. Common exhaust ducts for clothes dryers shall comply with Section 504.

501.4 Common supply ducts for ventilation air in dwelling units. A common supply duct shall not be used to provide ventilation air to separate dwelling units unless a single fan designed and intended to run continuously is located upstream of the supply outlets.

Reason: This change is intended to address cross-contamination of dwelling units with transfer air that could be communicated between units through common exhaust ducts that convey environmental air (e.g., exhaust from kitchens or baths) or common supply ducts that convey ventilation air. The language proposed is based on language that is sourced from ASHRAE 62.2-2010, addendum j. Without this requirement, the kitchen or bath exhaust from one dwelling unit could find its way into adjacent dwelling units, transporting moisture, odors, and other pollutants between units, instead of being conveyed outside the building. Similarly, cross contamination could also occur through the use of common supply ducts for ventilation air, unless properly addressed.

Common exhaust ducts for clothes dryers are already explicitly addressed in Section 504, and so are excluded from this requirement.

Cost Impact: Where contractors are not already installing separately ducted units or a common fan, the cost of construction is expected to increase.

M57-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.3(NEW)-M-MOORE.DOC

M58–12
501.3.1

Proponent: Umesh Kumar Bhargava, PE, Bhargava International Inc., representing self.

Revise as follows:

501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

3. For all *environmental air* exhaust: ~~3~~ 1 feet) from property lines; ~~3~~ 1 feet from operable openings into buildings for all occupancies other than Group U and ~~10~~ 5 feet from mechanical air intakes. Such exhaust shall not be considered to be hazardous or noxious.

(Portions not shown remain unchanged)

Reason: Local exhaust is more effective than central exhaust. Therefore, in dwelling unit's side wall exhaust is gaining more popularity amongst engineers. However due to limited exterior wall space availability and clearances requirements from openings, the proposed change is suggested based on following reasons:

a. Environmental air is discharged to outside the dwelling and therefore is diluted instantly and does not have impact on indoor air quality.
b. Products of combustion from Direct Vent appliances are permitted to terminate with 1 foot.
c. IMC permits to recirculate kitchen exhaust air. It indicates that environmental air is acceptable to be recirculating with carbon filter. Dilution of environmental air by mixing with atmospheric air should more effective than carbon filter, which depend on user behavior.
d. Velocity at exterior termination is approximately 5 miles per hour (600 feet per minute, 50 CFM thru 4 inch diameter duct)
e. High discharge velocity also results in mixing outside atmospheric air instantaneous dilution.

Cost Impact: None

M58-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.2.1-M-BHARGAVA.DOC

M59–12
501.3

Proponent: Umesh Kumar Bhargava, PE, Bhargava International Inc., representing self

Revise as follows:

501.3 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawl space.

Exceptions:

1. Whole-house ventilation-type attic fans shall be permitted to discharge into the attic space of *dwelling units* having private attics.
2. Commercial cooking recirculating systems.
3. <u>Where installed in accordance with the manufacturer's installation instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.</u>

Reason: Residential kitchen exhaust recirculating hoods are not stated in the Code explicitly.

Cost Impact: None

M59-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.2-M-BHARGAVA.DOC

M60–12
501.3, 501.3.1.1

Proponent: Robert Atkins, Prince William, VA, representing VA Plumbing and Mechanical Inspectors Association (VPMIA) and VA Building Code Officials Association (VBCOA) (radkins@pwcgov.org) and Guy McMann, MCP, Jefferson County Colorado, represented Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

501.3 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point~~ where it will not cause a nuisance and~~ not less than the distances specified in Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic, ~~or~~ crawl space, or be directed onto walkways.

~~**501.3.1.1 Exhaust discharge**. Exhaust air shall not be directed onto walkways.~~

Reason:
Atkins-.The term "nuisance" is too subjective and un-enforceable. Combining 501.3.1.1 into 501.3 (both titled "Exhaust discharge") is appropriate as it is applicable to all locations of exhaust discharge.

McMann-It's not necessary to have an entire Section on this topic when it can be incorporated into 501.2. The term "nuisance" in this instance is un-enforceable as it is too subjective in nature.

Cost Impact: None

M60-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.3-M-ATKINS-MCMANN.DOC

M61–12
501.4

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing Self (JBEngineer@aol.com)

Revise as follows:

501.4 Pressure equalization. Mechanical exhaust systems shall be sized to remove the quantity of air required by this chapter to be exhausted. The system shall operate when air is required to be exhausted. Where mechanical exhaust is required in a room or space in other than occupancies in R-3 and *dwelling units* in R-2, such space shall be maintained with a neutral or negative pressure. If a greater quantity of air is supplied by a mechanical ventilating supply system than is removed by a mechanical exhaust for a room, adequate means shall be provided for the natural or mechanical exhaust of the excess air supplied. If only a mechanical exhaust system is installed for a room or if a greater quantity of air is removed by a mechanical exhaust system than is supplied by a mechanical ventilating supply system for a room, adequate *makeup air* consisting of supply air, transfer air or outdoor air shall be provided to satisfy the deficiency. ~~The calculated building infiltration rate shall not be used to satisfy the requirements of this section.~~

Reason: Calculating the building infiltration rate is a valid method of providing make up for an exhaust system. I have personally designed in excess of 1000 buildings using the calculated infiltration rate to provide make up air for the exhaust system. All of these buildings are working without incident. Mechanical engineers are trained in methods for calculating the infiltration rate. There should not be an arbitrary requirement in the code that prohibits common engineering design practices.

Cost Impact: This change does not increase the cost of construction.

M61-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.4-M-BALLANCO.DOC

M62–12
501.3.2

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self (JBEngineer@aol.com)

Revise as follows:

501.3.2 Exhaust opening protection. Exhaust openings that terminate outdoors shall be protected with corrosion resistant screens, louvers or grilles. ~~Openings in screens, louvers and grilles shall be sized not less than 1/4 inch (6 mm) and not larger than 1/2 inch (13 mm).~~ Openings shall be protected against local weather conditions. Louvers that protect exhaust openings in structures located in hurricane-prone regions, as defined in the *International Building Code*, shall comply with AMCA Standard 550. Outdoor openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

Reason: There is no justification for requiring a small opening size for exhaust terminations. Furthermore, this can result in a fire hazard for exhaust ducts, such as dryer exhaust duct terminations. Many commercial buildings are performing without incident with louvers that have openings that exceed ½ inch. By implication, every termination would require a screen since a louver is either horizontal or vertical with the opening much greater than ½ inch. The opening size of a exhaust termination should be left for the engineer to design based on the system being installed.

Cost Impact: This change does not increase the cost of construction.

M62-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

501.3.2-M-BALLANCO.DOC

M63–12
502.14

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

502.14 Motor Vehicle Operation. In areas where motor vehicles operate, mechanical ventilation shall be provided in accordance with Section 403. Additionally, areas in which stationary motor vehicles are operated shall be provided with a source capture system that connects directly to the motor vehicle exhaust systems. <u>Such system shall be engineered by a registered design professional or shall be factory-built equipment designed and sized for the purpose.</u>

Exceptions:

1. This section shall not apply where the motor vehicles being operated or repaired are electrically powered.
2. This section shall not apply to one- and two- family dwellings.
3. This section shall not apply to motor vehicle service areas where engines are operated inside the building only for the duration necessary to move the motor vehicles in and out of the building.

Reason: Section 502.14 requires a *source capture system,* but no criteria or specs are given for such systems. At minimum, such systems need to be engineered systems as opposed to randomly chosen fans, pipe and hoses thrown together by an installer. The term is defined as a mechanical exhaust system that discharges to the outdoors with no further criteria given. Without this revision, the code could not be cited to prevent home-made concoctions and "handyman" specials from being installed.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal could increase the cost of construction.

M63-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

502.14-M-STRAUSBAUGH-PMGCAC.DOC

M64–12
502.20 (NEW), Table 404.3

Proponent: Guy McMann MCP, Jefferson County Colorado representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

502.20 Manicure and pedicure stations. Manicure and pedicure stations shall be provided with an exhaust system in accordance with Table 403.3, note h. Manicure tables and pedicure stations not provided with factory-installed exhaust inlets shall be provided with exhaust inlets located not more than 12 inches horizontally and vertically from the point of chemical application.

Revise as follows:

TABLE 404.3
MINIMUM VENTILATION RATES

h. For nail salons, each ~~nail~~ manicure and pedicure station shall be provided with a source capture system capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20

(Portions of table and footnotes not shown remain unchanged)

Reason: There needs to be more guidance in the code for code officials, designers and installers to reinforce the requirements for the source capture system at pedicure and manicure stations. Chemicals are being applied at pedicure stations and therefore needs to be included. There is much confusion as to where these outlets should be located in order to obtain maximum efficiency with as few fugitive vapors as possible. These dimensions have proven to work very well in observing many installations since these requirements were first a code requirement, and still provides the designer with flexibility. This will provide guidance where there currently is none as the definition of "source capture system" does not provide any.

Cost Impact: None

M64-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

502.20 (NEW)-M-MCMANN.DOC

M65–12
504.2 (NEW)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing In-O-Vate Technologies (JBEngineer@aol.com)

Add new text as follows:

504.2 Exhaust duct connections. Dryer exhaust ducts located in framed walls shall commence at a noncombustible dryer exhaust duct wall receptacle. The wall receptacle shall accommodate the connection between the dryer and the dryer exhaust duct.

(Renumber subsequent sections.)

Reason: A receptacle behind the dryer that facilitates the connection and the collection of the flex hose to occur in the cell of the wall is a device that will save lives and prevent property damage from dryer fires and increase the efficiency of the dryer appliance. It is well established that there are an average of 15,000 dryer fires a year in the United States.

Without a receptacle, an elbow connection endures stress that could damage the fitting to the point of needing replacement. Undetected leaks in the elbow can result in dryer exhaust air leaking into the cavity wall, creating a fire hazard.

Cost Impact: This will not increase the cost of construction.

M65-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.2(NEW)-M-BALLANCO.DOC

M66–12
504.4, 504.6.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination~~. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow.~~ Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or *chimney*. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

504.6.2 Duct installation. Exhaust ducts shall be supported at 4-foot (1219 mm) intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Ducts shall ~~not~~ be joined with <u>nominal ¼ inch long by 1/8 inch diameter rivets</u> ~~screws~~ or <u>other</u> fasteners that <u>do not</u> protrude into the inside of the duct <u>more than such rivets.</u>

Reason: Sections 504.4 and 504.6.2 both discuss duct fasteners, but, state different requirements and the IRC says something different yet. The IRC allows duct fasteners that protrude into the duct a limited distance. It is not logical for the IRC and IMC to differ on this subject. If duct fasteners are not allowed, there would be no method of securing duct joints other than duct tape. Tapes are sealing methods, not duct joining methods, and will eventually allow the duct joints to separate in concealed locations.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M66-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.4-M-STRAUSBAUGH.PMGCAC.DOC

M67–12
504.5

Proponent: Umesh Kumar Bhargava, Bhargava International, Inc.

Revise as follows:

504.5 Makeup air. Installations exhausting more than 200 cfm (0.09m3/s) shall be provided with *makeup air*. Where a closet is designed for the installation of a clothes dryer, an opening having an area of not less than 100 square inches (0.0645 m2) shall be provided in the closet enclosure or *makeup air* shall be provided by other *approved* means. <u>Make up air shall be provided at a rate of not less than 80 cfm for each domestic clothes dryer.</u>

Reason:
1. Clothes dryers manufacturers do not publish dryer exhaust air CFM requirements. These manufacturers publish only exhaust duct diameter requirements and equivalent duct length.
2. IMC should provide guidance of exhaust CFM for residential type clothes dryers. I have contacted several manufacturers and only one manufacturer indicated 220 CFM outlet with no duct attached.
3. Most manufacturers require 4 inch diameter round duct with 65 feet of equivalent length.
4. Duct diameter: 4 inch Pressure drop 1 inch wg per 100 feet Pressure Drop 65 feet = 0.65 CFM 100 Velocity: 1200
5. To keep laundry in negative pressure 80 CFM per dryer is suggested.

Cost Impact: None

M67-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.5(NEW)-M-BHARGAVA.DOC

M68–12
504.5 (NEW), 504.6.4, 504.6.4.3(NEW), Chapter 15

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., self

Add new text as follows:

504.5 Dryer Exhaust Duct Power Ventilators. Domestic dryer exhaust duct power ventilators shall conform to UL 705 for use in dryer exhaust duct systems. The dryer exhaust duct power ventilator shall be installed in accordance with the manufacturer's instructions.

(Renumber subsequent sections)

Revise text as follows:

504.6.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections 504.6.4.1 ~~or 504.6.4.2~~ through 504.6.4.3.

Add new text as follows:

504.6.4.3 Dryer exhaust duct power ventilator length. The maximum length of the exhaust duct shall be determined by the dryer exhaust duct power ventilator manufacturer's installation instructions.

Add new standard to Chapter 15 as follows:

UL Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

Standard Referenced number	Title	Reference in code section number
705-2004 Revision 5	Standard for Power Ventilators	504.5

Reason: This is a companion change to the change adding reference to UL 705 for dryer exhaust power ventilators. UL 705 has testing requirements that will establish the maximum length permitted for a dryer duct connecting to a dryer exhaust duct power ventilator. The maximum dryer duct length must be included in the manufacturer's installation instructions.

This will add the requirements for dryer exhaust power ventilators for domestic dryer use. Dryer exhaust duct power ventilators are now regulated by Supplemental requirements to UL 705. These supplemental requirements specify testing for ventilators used in this application. The requirements include many safety provisions for the ventilators. The ventilator manufacturer specifies the maximum length of the dryer exhaust duct. This length is used for testing and listing the ventilator, thus verifying the instructions.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [UL 705-2004, Revision 5] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M68-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.5-504.6.4-M-BALLANCO.DOC

M69–12
504.6.4.1

Proponent: Tom Allen, representing self

Revise as follows:

504.6.4.1 Specified length. The maximum length of the exhaust duct shall be 35 feet (10 668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table 504.6.4.1.

> **Exception.** Where a clothes dryer booster fan is installed and listed and labeled for the application, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the booster fan manufacturer's installation instructions. Where a clothes dryer booster fan is installed and not readily accessible from the room in which the dryer is located, a permanent identifying label shall be placed adjacent to where the exhaust duct enters the wall. The label shall bear the words: "This dryer exhaust system is equipped with a remotely located booster fan."

Reason: Adds prescriptive and labeling requirements for drier boosted fan.

Cost Impact: There is a cost impact.

M69-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.6.4.1-M-ALLEN.DOC

M70–12
504.6.5

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association and Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

504.6.5 Length identification. Where the exhaust duct <u>equivalent length exceeds 35 feet</u> ~~is concealed within the building construction~~, the equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet (1829 mm) of the exhaust duct connection.

Reason: If the equivalent length is code compliant, there is no need for extra signage. This puts the code official in a position of recording each installation in order to verify at time of final that the stated length is accurate. This is over the top for code officials and installers to keep track of in a world of increasing duties and fewer resources. It should not matter if the duct is concealed or not as this is a benefit for the building owner or user.

Cost Impact: None

M70-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.6.5-M-GRACE-MCMANN.DOC

M71–12
504.6.7, 504.6, IFGC 614.6.3, IFGC 614.6

Proponent: C. Ray Allshouse, AIA, CBO, City of Shoreline, WA, representing the Washington Association of Building Officials Technical Code Development Committee (rallshouse@shorelinewa.gov)

Revise as follows:

504.6~~.7~~ (IFGC 614.6~~.3~~) Protection required. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than $1^1/_4$ inches (32 mm) between the duct and the finished face of the framing member. Protective shield plates shall be constructed of steel, have a thickness of 0.062 inch (1.6 mm) and extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

504.~~6~~7 (IFGC 614.~~6~~7) Domestic clothes dryer ducts. Exhaust ducts for domestic clothes dryers shall conform to the requirements of Sections 504.6.1 through 504.6.~~7~~6.

Reason: Existing dryer duct protection requirements for concealed dryer exhaust ducts should apply not only to domestic installations but to commercial installations as well. By making this a general dryer duct requirement, protection will be extended to include commercial clothes dryer exhaust ducts.

Cost Impact: The code change proposal will increase the cost of construction.

M71-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.6.7-614.6.3-M-ALLSHOUSE-.DOC

M72–12
504.8, Chapter 15

Proponent: John D. Nicholas of Perceptive Solutions LLC representing Unifrax I LLC (john@perceptivesolutionsllc.com)

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code.* Where a fire resistive metallic duct system is installed instead of a duct system within a shaft, the fire-resistive metallic duct system shall be listed and labeled in accordance with ASTM E2816 and the fire resistance rating shall be as required by the *International Building Code.*

(Portions not shown remain unchanged.)

Add new standard to Chapter 15 as follows:

ASTM
E2816-11, *Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems*

Reason: This proposed code change allows for the use of either a pre-fabricated duct system or field applied enclosure system in lieu of a shaft when these duct systems are tested and listed in accordance with *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* a full consensus test method that was specifically designed to assess both specific end use of the duct and its protection materials.

The history of many provisions in our building codes are traced back to ASTM E119 as it is the oldest fire-resistance standard cited in the U.S. building codes. However, when fire test standards were developed for specific material applications those test standards replaced ASTM E119. There are many examples of advancements in fire testing being used to provide a fire test based on ASTM E119 but specifically developed for a particular application: doors, windows, firestop systems, joint systems, etc. For example, doors were tested to ASTM E119, then ASTM E152, and now to UL10b and 10c, which were developed to assess the door's fire performance in a specific application. As products are in service for prolonged periods of time some performance limitations are noted and addressed by industry and the codes. This proposed code change is a cost effective method of providing a test specifically designed to test the duct system as the shaft is not tested as constructed in the field but rather as a wall panel. ASTM E119 does not have a protocol for testing shafts that can be engulfed in a fire. The fire-resistance engulfment test of ASTM E2816 is a much more serve test scenario for a shaft or duct system as the volume of air within the shaft or duct is limited and will heat faster than the ambient laboratory air in contact with the wall panel. Also, the stability of the shaft as constructed in the field will react differently than a wall panel. The corners of the shaft will be tested as the sides of the shaft create stresses on the corners that are not evaluated by the ASTM E119 wall panel, which is secured into a test frame. Using tests designed to address the actual construction and application of materials is more conservative and usually increases life safety. Further, sometimes newer fire tests allow more cost effective materials and construction than materials assessed by traditional tests not specifically designed to address their actual construction and application.

The clothes dryer exhaust duct system should comply with ASTM E2816 horizontal duct and vertical duct under the following situation. According to the text in Section 504.8 and referenced use, the clothes dryer exhaust duct system is designed to expel "…moisture and any products of *combustion* to the outside of the building," which indicates that the pressure of the contaminated air is negative relative to the building. There is a possibility that a fire may originate in the clothes dryer exhaust duct system because there may be products of combustion within the clothes dryer exhaust. Another possibility is that a fire surrounds (engulfs) the clothes dryer exhaust duct system. An unprotected clothes dryer exhaust duct system will allow the products of *combustion* to be heated and potentially ignite, which may facilitate the spread of fire within the building. Therefore, clothes dryer exhaust duct system should be isolated from the building to prevent the spread of fire as intended by the use of a fire resistive metallic duct systems, which are fire tested for these specific events: fire inside the duct and fire outside the duct. Fire resistive metallic duct systems tested and listed to ASTM E2816 may provide a higher degree of fire protection. Shaft enclosures tested to ASTM E119 are tested as panels and are not subjected to an engulfment scenario as are fire resistive metallic duct systems tested and listed to ASTM E2816.

This method of tests uses the ASTM E119 time-temperature curve and replicates use of exhaust by using a fan technique to create a negative pressure within the duct similar to that occurring while a clothes dryer exhaust system is in use. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts. In ASTM E2816, the systems supports are also tested as part of the fire resistance test. ASTM E2816 offers the following tests to assess performance: ASTM E84 for the system's flame spread and smoke developed indices, ASTM E136 for insulation's non-combustibility, ASTM C518 for the insulation's durability and ASTM E814 for the system's ability as a firestop to prevent the spread of fire from compartment to compartment, ASTM E2226 for the resistance to the application of a hose stream, and ASTM C411 for the insulation covering's and lining's ability to resist flaming, glowing, smoldering or smoking while in service, which was just approved in December 2011 and this test method will also become part of the standard upon its latest publication. ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* originally cited ISO 6944 as the test to determine the duct system's fire resistance but now cites ASTM E2816-11 for that purpose as well as to determine the characteristics of the system and enclosure material currently cited in the codes. ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* cites ASTM E2816-11 to establish requirements for fire protection enclosure systems, applied to metallic HVAC ducts which provide an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations, as well as to determine the characteristics of the system and enclosure material currently cited in the codes.

Table 1. Loss Measures for Clothes Dryer Fires in Buildings[1]

[All fires, 3-year average (2002-2004)]

Measure	All Buildings	Non-residential Buildings	Residential Buildings
Loss per fire	$8,891	$7,462	$9,176
Injuries per 1000 fires	37.2	58.9	33.0
Deaths per 1000 fires	1.0	0.0	1.2

Source: NFIRS 5.0 data only; Loss per fire is computed for only those fires where loss information was provided

These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2816 who drafted its first version, as the ANSI Designated Expert to ISO TC92 SC2 WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 1: Ventilation Ducts* and one who has designed, supervised, and overseen HVAC fire tests as part of an international laboratory as well as one who had jurisdiction over the product certification process for products and materials.

Bibliography:
1. www.usfa.fema.gov/downloads/pdf/tfrs/v7i1.pdf

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM E2816-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M72-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.8-M-NICHOLAS.DOC

M73–12
504.8, 505.3 (NEW)

Proponent: Al Godwin, CBO, CPM representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

(Items 1 through 12 remain unchanged)

13. Dryer ducts shall have a cleanout located near the shaft penetration to permit cleaning of the 22” subduct required by Section 607.5.5, exception 2. The subduct length shall be considered in the calculation of allowable duct length.

505.3 Common exhaust systems for domestic kitchens located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple domestic kitchen exhaust systems, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*.
2. Dampers shall be prohibited in the exhaust duct, except as specified in Section 505.1. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, exception 2.
3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of sheet steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage) and in accordance with SMACNA *Duct Construction Standards*.
4. The ductwork within the shaft shall be designed and installed without offsets.
5. The exhaust fan motor design shall be in accordance with Section 503.2.
6. The exhaust fan motor shall be located outside of the airstream.
7. The exhaust fan shall run continuously, and shall be connected to a standby power source.
8. Exhaust fan operation shall be monitored in an *approved* location and shall initiate an audible or visual signal when the fan is not in operation.
9. Makeup air shall be provided for the exhaust system.
10. A cleanup opening shall be located at the base of the shaft to provide access to the duct to allow for cleanout and inspection. The finished openings shall be not less than 12 inches by 12 inches (305 mm by 305 mm).
11. Screens shall not be installed at the termination.
12. The common multistory duct system shall serve only kitchen exhaust and shall be independent of other exhaust systems.

Reason: Since exception 2 has been installed in the IBC, it has been incomplete. The IMC has done a good job of updating the provisions for common ducts with clothes dryers but nothing has been done for domestic kitchens. Designers would not go to the expense of installing a shaft for domestic kitchen exhaust if there was not a smoke issue. When expensive condo’s install super domestic kitchens, there is going to be smoke.

Also, IMC Section 505.1 specifically requires systems with downdraft exhaust to discharge to the exterior. How is that going to be done in a multi-story building? And, where there is smoke, there is grease. Thus, provisions are needed for kitchen exhaust and such exhaust needs to be separate from bathroom/toilet exhaust. The designer should take some responsibility for controlling grease discharge, but specifics are left to his/her discretion. Long dryer ducts have to install a 90 degree riser at the very end of their discharge, the weakest point. A cleanout is appropriate. Perhaps someone has a better idea, but this should be a start.

Cost Impact: This code proposal will not increase the cost of construction since this is the method it should be designed to and it is less expensive than installation of a Type I hood.

M73-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.8-M-GODWIN.DOC

M74–12
504.8, Chapter 15

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*. <u>As an alternative to a fire-resistance-rated shaft, the duct shall be enclosed in a duct enclosure system tested and *listed* to have not less than a 2-hour fire-resistance rating in accordance with ASTM E2816-11.</u>

(Portions not shown remain unchanged)

Add new Referenced Standard to Chapter 15 as follows:

<u>ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.</u>

Reason: This proposal would allow an additional tested method of protection for duct enclosures systems to be used. The enclosures or ductwork would be permitted to be used if it were protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose. This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criterion provides an alternate to shaft enclosures for vertical ducts.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard evaluates the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment when subjected to the standard time-temperature curve of ASTM E119.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM E2816-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M74-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

504.8-M-CRIMI.DOC

M75–12
505.1

Proponent: Joshua Smith, New York State Office of Fire Prevention and Control (Joshua.Smith@dhses.ny.gov)

Revise as follows:

SECTION 505
DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft or updraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls and shall be air tight and equipped with a backdraft damper.

Exceptions:

1. Where installed in accordance with the manufacturer's installation instructions, where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4 and, where a smoke alarm or detector is not present within 20 ft horizontally of the cooking appliances, listed and labeled ductless range hoods shall not be required to discharge to the outdoors
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:
   - 2.1. The duct shall be installed under a concrete slab poured on grade.
   - 2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   - 2.3. The PVC duct shall extend not greater than 1 inch (25 mm) above the indoor concrete floor surface.
   - 2.4. The PVC duct shall extend not greater than 1 inch (25 mm) above grade outside of the building.
   - 2.5. The PVC ducts shall be solvent cemented.

Reason: The purpose of this code change is to reduce the number of nuisance fire alarms due to normal cooking conditions. Hoods that do not vent to the outside have added to the number of nuisance fire alarms by recirculating the dirty air further throughout the cooking area. In many cases the hoods that do not vent to the outside end up pointing the products of combustion directly at a smoke detector. R-2 Occupancies specifically can present a special hazard because many are required to have smoke detection in the kitchen area because it is located directly outside of a sleeping room. The design and layout of the dwelling unit within the occupancy in itself can be a cause for a rise in nuisance fire alarms. Because it is impractical and dangerous to remove life safety devices other provisions should be made to reduce the number of nuisance alarms. In R-2 occupancies that have retrofitted in ventilation direct to the outside of the building the number of cooking related nuisance fire alarms due to normal cooking vapor have been reduced.

Cost Impact: This proposal will increase the cost of construction.

M75-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.1-M-SMITH.DOC

M76-12
505.1, 505.3(NEW), 507.2.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 505
DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are ~~located within dwelling units~~ provided, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems.

Exceptions:

1. In other than Group I-1 and I-2, where installed in accordance with the manufacturer's installation instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:
   - 2.1. The duct shall be installed under a concrete slab poured on grade.
   - 2.2. The under floor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   - 2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
   - 2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
   - 2.5. The PVC ducts shall be solvent cemented.

505.2 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cfm (0.19 m^3/s) shall be provided with *makeup air* at a rate approximately equal to the *exhaust air* rate. Such *makeup air* systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

505.3 Other than Group R. In other than Group R occupancies, where domestic cooking appliances are utilized for domestic purposes, such appliances shall be provided with domestic range hoods. Hoods and exhaust systems shall be in accordance with Sections 505.1 and 505.2.

SECTION 507
COMMERCIAL KITCHEN HOODS

507.2.3 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2. Domestic cooking appliances utilized for domestic purposes shall comply with Section 505.

Reason: The intent of this proposal is to clarify requirements and address new situations as Assisted Living and Nursing Home designs change.

Current requirements for domestic appliances used for domestic purposes are geared towards Group R facilities. When a stove is located in another use group, often a requirement for commercial hoods is misapplied. In a residential dwelling unit, often a range hood is not required if there is enough ventilation. Given the different types of facilities, this proposal would always require a hood when a range was provided in another use group.

As the style of assisted living facilities and nursing homes attempts to produce a more residential atmosphere, domestic ranges are provided either within the unit (some assisted living) or in common use areas (assisted living or nursing home residential 'suites'). Residents use this equipment for light cooking duties (few people and only occasional meals) or special cooking (i.e., cookies, cakes). If this equipment is used for cooking for a large number of residents on a regular basis, it is being used for commercial purposes, and it would fall under 507.2.3.

Hospitals or outpatient rehab facilities sometimes have domestic ranges in occupational therapy and dietician areas. The goal being to provide residents with training on good eating habits when they are at home.

Changes to 505.1 would allow residential and areas such as business break rooms to allow for recirculation if the mechanical system is designed for it.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: Reduction

M76-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505-M-BALDASSARRA-CTC.DOC

M77–12
505.1

Proponent: Gary Kreutziger, M.C.P., City of San Antonio, representing Gary Kreutziger (gkreutziger@sanantonio.gov)

Revise as follows:

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are ~~located within dwelling units~~ installed, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems.

Reason: The change will provide prescriptive requirements for all installations of domestic range hoods and domestic appliances with downdraft exhaust. As the section is currently written it only applies to dwelling units. Domestic appliances are often installed in church kitchens, assisted living classrooms, break rooms, child care facilities, fire stations, etc. all of which use the domestic appliances in the same manner and with approximately the same frequency as a dwelling unit. IMC section 507.2.3 requires a type I or II hood over domestic appliances utilized for commercial purposes. Most jurisdictions would not consider the domestic appliances installed in the aforementioned occupancies as utilized for commercial purposes. This code change will provide direction where the code is currently silent.

Cost Impact: The code change proposal will not increase the cost of construction.

M77-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.1-M-KREUTZIGER

M78–12
505.1, 505.1.1(NEW)

Proponent: William Freer, New York State Office of Fire Prevention and Control (WFreer@dhses.ny.gov)

Revise as follows:

SECTION 505
DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems.

Exceptions:

1. Where installed in accordance with the manufacturer's installation instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:
   2.1. The duct shall be installed under a concrete slab poured on grade.
   2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   2.3. The PVC duct shall extend not greater than 1 inch (25 mm) above the indoor concrete floor surface.
   2.4. The PVC duct shall extend not greater than 1 inch (25 mm) above grade outside of the building.
   2.5. The PVC ducts shall be solvent cemented.

<u>**505.1.1 Exhaust equipment activation.** Where required by the code official, domestic range hood and downdraft exhaust systems shall be interconnected with the domestic cooking appliance served so that such range hoods and downdraft exhaust systems automatically activate when the domestic appliance is in use.</u>

Reason: The purpose of this code change is to reduce the number of nuisance fire alarms. A major contributor to the number of nuisance alarms in R-2 occupancies has been the resident failing to turn the hood on while cooking. This is most prevalent in student housing but can also been seen in senior and apartment housing. The current code requires the hood / ventilation be in place but has no means of requiring or making the user turn them on. By adding a low cost interlock the vent would be in operation anytime cooking was in progress. This would strengthen the current code while keeping with its original intent.

At Bard College in Northern Dutchess County they have a major nuisance fire alarm problem that they have been diligently working on. They first tried changing their hoods to vent to the outside. That change cut the nuisance alarm in about half. Still not happy with the number of nuisance alarms they added the interlocking devices to the new dorm. To date, there have been no nuisance alarms in the new building.

Cost Impact: The code change proposal would increase the cost of construction.

M78-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.1.1(NEW)-M-FREER.DOC

M79–12
505.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

505.2 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cfm shall be mechanically provided with *makeup air* at a rate approximately equal to the *exhaust air* rate. Such *makeup air* systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

Reason: Section 505.2 does not state whether the makeup air system is required to be mechanical or gravity. Current text certainly suggests that mechanical is required. Should a simple louvered opening with a damper be permitted to provide makeup air by gravity? If so, how much pressure loss is allowed across the louvered opening? This loss must be known in order to calculate the opening and louver size. The code is silent on this. The intent is to prevent negative pressures from being developed by the kitchen exhaust that would affect other exhaust systems, chimneys, fireplaces, appliances and appliance vents. A small gravity opening to the outdoors would allow makeup air to enter the kitchen, but how negative must the space go to cause the necessary airflow rate to pass through such opening? Mechanical makeup air can be matched to the exhaust rate with no pressurization of the space.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This could increase the cost of construction depending on how current text is interpreted.

M79-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.2-M-STRAUSBAUGH.PMGCAC.DOC

M80–12
505.2

Proponent: Dan Buuck, National Association of Home Builders (NAHB) (dbuuck@nahb.org)

Revise as follows:

505.2 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (0.19 m3/s) shall be provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 400 cubic feet per minute (0.19 m3/s). Such makeup air systems shall be equipped with a backdraft damper~~means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system~~.

> **Exception:** In dwelling units, where all appliances are of direct-vent, power-vented, unvented, or electric type, makeup air is not required for hood systems that exhaust 600 CFM or less. Exhaust hood systems located in such dwelling units and capable of exhausting in excess of 600 cubic feet per minute (0.28 m3/s) shall be provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 600 cubic feet per minute.

Reason: This section, new in the 2009 International Residential Code (IRC) and 2009 International Mechanical Code (IMC), attempts to solve an unproven backdrafting problem with range hoods. The exhaust rate of 400 cubic feet per minute (cfm) was chosen arbitrarily and without substantiation other than it being greater than the minimum exhaust rate of range hoods on the market. However, several manufacturers do not produce any range hoods below the 400 cfm threshold, effectively reducing a homeowner's choice of kitchen exhaust options without the added difficulty and expense of installing makeup air.

The reasoning that kitchen exhaust systems are available with an exhaust rate under 400 cfm does not take down-draft systems, popular with homeowners, into consideration. Most of them operate at 500 to 600 cfm and therefore require makeup air under this section.

As written, this section allows range hoods up to 400 cfm to be installed without makeup air. It would be consistent to require makeup air equaling the amount above and beyond 400 cfm for larger fans. Essentially, there would be no difference between the effect a 400 cfm fan has on a house and a 600 cfm fan with 200 cfm of makeup air. This would also improve the feasibility and acceptance of this code section as well as cut down on the amount of wasted energy in heating or cooling the makeup air.

This section requires an automatic means of closure for the makeup air opening beyond what the code has historically required for residential construction. For example, Section G2407.6 requires no dampers whatsoever for combustion air openings to the outdoors, such as found in many homes in the northern US. The amended section would allow barometric dampers as required for clothes dryer exhaust ducts.

Finally, the current code section does not take into account the fact that in many homes there is no danger of backdrafting (the original reason for this code section) due to the lack of natural draft appliances. The 400 cfm threshold could be raised to 600 cfm in those cases with no added danger. This would allow for down-draft fans without dedicated makeup air when the exception is met.

Cost Impact: The code change proposal will not increase the cost of construction.

M80-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.2-M-BUUCK.DOC

M81–12
505.3

Proponent: Tom Allen, representing self

Add new text as follows:

505.3 APPLIANCES ABOVE COOKING APPLIANCES. The installation of a listed and labeled cooking appliance or microwave oven over a listed and labeled cooking appliance shall conform to the terms of the upper appliance's listing and label and the manufacturer's installation instructions.

Reason: Adds requirements for installation of Microwave ovens over cooking appliances.

Cost Impact: There is no cost impact.

M81-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.3 (NEW)-M-ALLEN.DOC

M82–12
505.3 (NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

505.3 OVERHEAD EXHAUST HOODS. Domestic open-top broiler units shall be provided with an exhaust hood, installed accordance with Section 623.7 of the *International Fuel Gas Code*. The hood shall be at least as wide as the broiler unit and shall extend over the entire unit. Such exhaust hood shall discharge to the outdoors and shall be equipped with a back draft damper or other means to control infiltration/exfiltration when not in operation.

> **Exception:** Broiler units incorporating an integral exhaust system, and listed and labeled for use without an exhaust hood, need not be provided with an exhaust hood.

Reason: Adds requirements for installation of exhaust hoods over domestic open top broilers.

Cost Impact: There is a cost impact.

M82-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

505.4(NEW)-M-ALLEN.DOC

M83–12
506.3.2.5, 506.3.2.5.1, 506.3.2.5.2, 506.3.2.5.3

Proponent: Steve Ferguson, representing ASHRAE

Delete and substitute as follows:

~~**506.3.2.5 Grease duct test.** Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid tight.~~

~~A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.~~

506.3.2.5 Duct Leakage Performance Testing. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed to determine that all welded joints and seams are liquid tight. Ducts shall be considered to be concealed where they are installed in shafts or covered by coatings or wraps that prevent the duct from being visually inspected on all sides. It is permissible to test the duct in sections, provided that, after the duct system is completely assembled, all field-assembled joints, including the duct-to-hood connection, are tested. For testing performed in accordance with this section, only the field-assembled joints of listed factory-built grease ducts are required to be tested.

The leakage test shall consist of a light test, an air or a water pressure test, or an approved equivalent test. The permit holder shall be responsible for providing the necessary equipment for performing the test.

506.3.2.5.1 Light Test. The light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. Light from the duct interior shall not be visible through any exterior surface.

506.3.2.5.2 Air Test. The air test shall be performed by sealing the entire duct system from the hood exhaust opening(s) to the duct termination. The sealed duct system shall then be pressurized to a pressure of not less than 1.0 inch water column and the duct system shall be required to hold this pressure for not less than 20 minutes.

506.3.2.5.3 Water Test. The water test shall be performed by use of a pressure washer operating at a pressure of not less than 1,500 psi and simulating cleaning operations. The water shall be applied directly to all areas to be tested. Water applied to the duct interior shall not be visible on any exterior surface in any volume during the test.

Reason: The proposed language is the current Section 5.2 Duct Leakage Performance Testing of ASHRAE's Standard 154-2011 "Ventilation for Commercial Cooking Operations". The 154 Standards Committee received input from the general public, committee members, members of ASHRAE TC 5.10 "Kitchen Ventilation", IMC members, specifiers, end-users and manufacturers while considering the proposed language for inclusion in Standard 154. During the considerations some of the comments and reasons for the final language include:

1. In field installations where duct systems may be high above finished floors or in tight enclosures it may be very difficult or even unsafe for an inspector to access all seams and joints that need to be inspected using the IMC light test method.
2. Pressure test may be more practical for longer or elevated runs. The pressure test is already in use in some areas including Minnesota where it is a grease duct test method required by State Building/Mechanical Code.

3. Water leaks are more easily located than light or pressure leaks. Additionally pressure washing is one of the primary methods used to clean kitchen grease duct systems. Exposing these duct systems to the water test method during commissioning can detect and prevent future water leaks caused by high pressure washing.
4. These tests may be used in combination if the facility and duct routing make one test in one area of the duct system more practical than another.

Cost Impact: Zero. The light test is already a code requirement. The additional test methods only offer alternatives that may be better suited to a particular installation.

M83-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.2.5-M-FERGUSON.DOC

M84–12
506.3.2.5

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

506.3.2.5 Grease duct test. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test or an air test shall be performed to determine that all welded and brazed joints are liquid tight. A test shall be performed for the entire duct system, including the hood-to-duct connection. For listed factory-built ducts, tests shall be limited to duct joints assembled in the field and shall exclude factory welds. The duct work shall be permitted to be tested in sections, provided that every joint is tested.

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. ~~A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.~~

An air test shall be performed by capping the ductwork system at the outlet and at the point of connection to the hood and then pressurizing the system with air at a pressure of not less than 1 inch wc. A manometer shall be used to measure pressure within the ductwork. Before taking pressure readings, the temperature of the air in the ductwork and the ductwork itself shall be allowed to stabilize and the source of air pressure shall be disconnected from the ductwork system. The ductwork system shall maintain the pressure without loss for a period of not less than 15 minutes.

Reason: The code allows only one method of testing grease ducts and that method is far from precise. An air test is much more likely to expose a leak and provides the installer with an option. This air test is also allowed by ASHRAE 154. Much of Sections 506 and 507 is parallel with 154.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.2.5-M-STRAUSBAUGH.PMGCAC.DOC

M85–12
506.3.7.1

Proponent: Curt Campbell, Chesterfield County, VA, representing Va. Plumbing and Mechanical Inspectors Association (VPMIA) and Va. Building Code Officials Association (VBCOA) (CampbellCu@chesterfield.gov)

Revise as follows:

506.3.7.1 Grease <u>duct</u> reservoirs. Grease <u>duct</u> reservoirs shall:

1. Be constructed as required for the grease duct they serve.
2. Be located on the bottom of the horizontal duct or the bottommost section of the duct riser.
3. Have a length and width of not less than 12 inches (305 mm). Where the grease duct is less than 12 inches (305 mm) in a dimension, the reservoir shall be not more than 2 inches (51 mm) smaller than the duct in that dimension.
4. Have a depth of not less than 1 inch (25.4 mm).
5. Have a bottom that is sloped to a point for drainage.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer's instructions where manufactured devices are utilized.

Reason: IMC 506.5.2 references an approved grease reservoir for manufactured vertical grease exhaust fans. The current language would require this reservoir to comply with 506.3.7.1, which of course is not applicable. This language should clearly show that these two grease reservoirs are two entirely different devices.

Cost Impact: The code change proposal will not increase the cost of construction.

M85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.7.1-M-CAMPBELL.DOC

M86–12
506.3.8

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

506.3.8 Grease duct cleanouts and openings. Grease duct cleanouts and openings shall comply with all of the following:

1. Grease ducts shall not have openings except where required for the operation and maintenance of the system.
2. Sections of <u>vertical</u> grease ducts that are inaccessible from the hood or discharge openings shall be provided with cleanout openings <u>spaced not more than 20 feet apart and not more than 10 feet from changes in direction greater than 45 degrees</u>.
3. Cleanouts and openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the duct.
4. Cleanout doors shall be installed liquid tight.
5. Door assemblies including any frames and gaskets shall be approved for the application and shall not have fasteners that penetrate the duct.
6. Gasket and sealing materials shall be rated for not less than 1500ºF (816ºC).
7. Listed door assemblies shall be installed in accordance with the manufacturer's instructions.

Reason: Sometimes there are vertical sections of grease duct that are in the middle of a run and inaccessible from the hood, fan or horizontal cleanouts and it can extend long distances. This may apply in high rise buildings as the grease will congeal over this vertical distance as it cools making it difficult to clean because there is no access. This is a helpful clarification as how to access these sections of duct that could not be otherwise accessed.

Cost Impact: This may increase the cost of construction.

M86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.5-M-MCMANN.DOC

M87–12
506.3.7.1

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

506.3.7.1 Grease reservoirs. Grease reservoirs shall:

1. Be constructed as required for the grease duct they serve.
2. Be located on the bottom of the horizontal duct or the bottommost section of the duct riser.
3. ~~Have a length and width of not less than 12 inches (305 mm). Where the grease duct is less than 12 inches (305 mm) in a dimension, the reservoir shall be not more than 2 inches (51 mm) smaller than the duct in that dimension.~~
3. Extend across the full width of the duct and have a length of not less than 12 inches.
4. Have a depth of not less than 1 inch (25.4 mm).
5. Have a bottom that ~~is sloped to a point for drainage.~~ slopes to a drain.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer's instructions where manufactured devices are utilized.

Reason: The current text permits grease to pass by the trap as a result of being anything smaller than the full width of the duct. There is no need to require a minimum arbitrary length as long as the fitting captures the grease as intended by the designer. Item 5 requires a sloped bottom but fails to actually require a drain. Sometimes simpler is better.

Cost Impact: None

M87-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.7.1-M-MCMANN.DOC

M88–12
506.3.11

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association; Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the International Building Code . The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating not less than that of the floor assembly penetrated, and not less than 1 hour. <u>Fire dampers shall not be installed in grease ducts.</u> Duct enclosures shall be as prescribed by Section 506.3.11.1, 506.3.11.2 or 506.3.11.3.

Reason: Although this states the obvious, the code just needs to come out and directly say that this is not an option.

Cost Impact: None

M88-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11-M-GRACE-MCMANN.DOC

M89–12

506.3.11, 506.3.11.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council (tcrimi@sympatico.ca) and John D. Nicholas of Perceptive Solutions LLC representing Unifrax I LLC (john@perceptivesolutionsllc.com)

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Duct enclosures shall be as prescribed by Section 506.3.11.1 or 506.3.11.2 ~~or 506.3.11.3~~.

~~**506.3.11.1 Shaft enclosure.** Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.~~

506.3.11.<u>1</u> ~~2~~ Field-applied grease duct enclosure.
Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by field applied grease duct enclosure that is a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire-stop system classified in accordance with ASTM E 814 or UL 1497 and having a "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions. Partial application of a field-applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

506.3.11.<u>2</u> ~~3~~ Factory-built grease duct assemblies. Factory- built grease duct assemblies incorporating integral enclosure materials shall be *listed* and *labeled* for use as commercial kitchen grease duct assemblies in accordance with UL 2221. Duct penetrations shall be protected with a through-penetration firestop system classified in accordance with ASTM E 814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such assemblies shall be installed in accordance with the listing and the manufacturer's installation instructions.

506.3.11.<u>3</u> 4 Duct enclosure not required. A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

Reasons:

CRIMI- The use of a grease duct enclosure installed in conformance with the IBC requirements for shaft construction is really just another "field-applied" grease duct enclosure system, and should be subject to the same conditions as any other field-applied grease duct enclosure system. In that case, Section 506.3.1 becomes redundant, since testing in conformance with ASTM E2336 addresses the issues related to clearances to combustible and noncombustible construction.

The historical practice of allowing certain materials to be used to enclose grease ducts serving Type 1 hoods without specifically fire testing then for the application needs to be revisited. The IBC requirements for shaft construction cover many items, but the fire-resistance requirements to conform to ASTM E119 do not address normal service conditions for grease ducts at all. Evaluating enclosure materials used to protect a grease duct from fire is an aid for predicting their fire performance and promotes uniformity in requirements of various authorities. To do this it is necessary that the fire-endurance properties of enclosure materials be measured and specified according to a common standard expressed in terms that are applicable alike to a wide variety of materials, situations, and conditions of exposure. The ASTM E2336 and UL 2221 test methods evaluate the enclosure materials and the grease duct enclosure systems using the following test methods: noncombustibility, fire resistance, durability, internal fire, and fire-engulfment with a through-penetration fire stop.

In contrast to the requirements of IBC Section 713 for Shaft Enclosures, these test methods prescribe a standardized fire exposure for comparing the test results of grease duct enclosure materials and grease duct enclosure systems. Using these test results to predict the performance of actual grease duct enclosure systems requires the evaluation of these specific test conditions.

Over the last decade, the technology surrounding the installation and protection of grease ducts has evolved in response to growing concern over grease duct fires, and concerns over space. The protection of grease ducts under fire exposure conditions is an item of importance in securing constructions that are safe, and that are not a menace to adjacent construction or building occupants. Protection of grease ducts has long been addressed in the codes of many authorities, municipal and other agencies. Many types of enclosure materials are used to protect grease ducts. Normally, these enclosure materials are either applied to grease ducts in the field or are fabricated as part of the grease duct when shipped from the factory.

NICHOLAS-This proposed code change allows for the use of either a pre-fabricated duct system or field applied enclosure system when these systems are tested and listed in accordance with *ASTM E2336, Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems* a full consensus test method that was specifically designed to assess both specific end use of the duct and its protection materials.

The history of many provisions in our building codes are traced back to ASTM E119 as it is the oldest fire-resistance standard cited in the U.S. building codes. However, when fire test standards are developed for specific material applications those test standards replaced ASTM E119. There are many examples of advancements in fire testing being used to provide a fire test based on ASTM E119 but specifically developed for a particular application: doors, windows, firestop systems, joint systems, etc. For example, doors were tested to ASTM E119, then ASTM E152, and now to UL10b and 10c, which were developed to assess the door's fire performance in a specific application. This proposed code change is a cost effective method of providing a test specifically designed to test the duct system as the shaft is not tested as constructed in the field but rather as a wall panel. ASTM E119 does not have a protocol for testing shafts that can be engulfed in a fire. The fire-resistance engulfment test of ASTM E2336 is a much more serve test scenario for a shaft or duct system as the volume of air within the shaft or duct is limited and will heat faster than the ambient laboratory air in contact with the wall panel. Also, the stability of the shaft as constructed in the field will react differently than a wall panel. The corners of the shaft will be tested as the sides of the shaft create stresses on the corners that are not evaluated by the ASTM E119 wall panel, which is secured into a test frame. Using tests designed to address the actual construction and application of materials is more conservative and usually increases life safety. Further, sometimes newer fire tests of materials allow more cost effective materials and construction than materials assessed by traditional tests not specifically designed to address their actual construction and application.

As products are in service for prolonged periods of time some performance limitations are noted and addressed by industry and the codes. GA-216-2007, *Specifications for the Application and Finishing of Gypsum Panel Products* states "1.4 Gypsum panel products shall not be used where they will be exposed to sustained temperatures of more than 125ºF (52ºC) for extended periods of time.[1]"

Also, several changes related to the use of conventional shaft materials have taken place within the building and mechanical codes over the years. For example, the IMC under Section 602.2 **Construction** states, "The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature." A similar limitation is noted in the IMC under Section 603.5.1 **Gypsum Ducts** states, "The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125ºF (52ºC) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. Air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers." For these reasons, a shaft wall construction tested to ASTM E119 as a panel may not provide the performance when that construction is tested as a shaft engulfed in a fire. Nor may a shaft wall construction tested to ASTM E119 as a panel maintain its stability and insulation when tested as a shaft subjected to a prolonged service test temperature established by UL1978 and adopted by ASTM E2336 and UL 2221.

Both ASTM E2336 and UL2221 have an engulfment fire tests and a portion of their standard dedicated to a prolonged internal service temperature test, approximately 500°F, which must be maintained for a minimum of 4-hour exposure. Then with 15 minutes the fire test temperature is increase to approximately 2000°F and sustained for 30 minutes. These test protocols are designed to subject the fire protection materials to an exposure that may be experienced in service. As these tests where not developed for a particular material, having conventional shaft materials tested to the same tests will ensure conformity of fire protection and dispel concerns about the service temperature limitations, which may decrease the performance of conventional shaft materials, cited in the codes and by the industry.

This method of tests uses the ASTM E119 time-temperature for the engulfment test to assess the duct system. This method of tests also assesses both internal and external fire threats as well as both horizontal ducts and vertical ducts. In ASTM E2336, the systems supports are also tested as part of the fire resistance test. ASTM E2336 offers the following tests to assess performance: ASTM E136 for insulation's non-combustibility, ASTM C518 for the insulation's durability and ASTM E814 for the system's ability as a firestop to prevent the spread of fire from compartment to compartment, and ASTM E2226 for the resistance to the application of a hose stream.

ICC-ES AC101, *Acceptance Criteria For Grease Duct Enclosure Assemblies*, establishes requirements for fire protection enclosure systems, applied to grease ducts which provide an alternate to required fire-resistance-rated shafts, as well as to determine the characteristics of the system and enclosure material currently cited in the codes.

These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2336 who drafted its first version, as the ANSI Designated Expert to ISO TC92 SC2 WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 2: Kitchen Extract Ducts* and one who has designed, supervised, and overseen grease duct fire tests as part of an international laboratory as well as one who had jurisdiction over the product certification process for products and materials.

Bibliography:
1. GA-216-2007, Copyright 2007, Gypsum Association

Cost Impact: This change will potentially reduce the cost of construction.

M89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11-M-CRIMI-NICHOLAS.DOC

M90–12
506.3.11

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces shall be enclosed from the point of penetration to the outlet terminal. <u>In-line exhaust fans not located outdoors shall be enclosed as required for grease ducts.</u> A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*.

Reason: Section 506.3.11 does not state that in-line fans located inside the building would have to be enclosed no differently than a grease duct. Such fans are installed in, and as part of, the duct system and if the duct must be enclosed, so too must the fan.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal could increase the cost of construction depending upon how current text is interpreted.

M90-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11#2-M-STRAUSBAUGH.PMGCAC.DOC

M91–12
506.3.11

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Duct enclosures shall be as prescribed by Section 506.3.10.1, 506.3.10.2 or 506.3.10.3. Penetrations of the grease duct enclosure made by the grease duct are not required to be protected by fire dampers or smoke dampers.

Reason: Section 712.1.5 of the IBC refers to the IMC for protection of grease duct penetrations. It is the intent that the enclosure requirements of Section 506.3.11 negate the need for fire dampers in grease ducts, however, the code has never clearly stated this intent. This proposal does not prohibit the installation of fire dampers that are part of a listed Type I hood.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11#1-M-STRAUSBAUGH.PMGCAC.DOC

M92–12
506.3.11, 506.3.11.1, 506.3.11.2, 506.3.11.3, Chapter 15

Proponent: Bob Eugene/Underwriters Laboratories/Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

506.3.11 Grease duct enclosures. A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be ~~either~~ a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with 506.3.11.2 or a factory-built enclosure assembly in accordance with Section 506.3.11.3. Duct enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. ~~Duct enclosures shall be as prescribed by Section 506.3.11.1, 506.3.11.2 or 506.3.11.3.~~

> **Exception:** ~~**506.3.11.4 Duct enclosure not required.**~~ A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

506.3.11.1 Shaft enclosure. ~~Commercial kitchen grease~~ Grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

506.3.11.2 Field-applied grease duct enclosure. ~~Commercial kitchen grease~~ Grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a *listed* and *labeled* field-applied grease duct enclosure ~~that is a listed and labeled~~ material, systems, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration ~~fire-stop~~ firestop system ~~classified~~ tested and *listed* in accordance with ASTM E 814 or UL ~~1497~~ 1479 and having a “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions. ~~Such fire-stop systems shall be installed in accordance with the listing and the manufacturer’s installation instructions.~~ Partial application of a field-applied grease duct enclosure shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

506.3.11.3 Factory-built grease duct enclosure assemblies. Factory-built grease ducts ~~assemblies~~ incorporating integral enclosure materials shall be *listed* and *labeled* for use as ~~commercial kitchen~~ grease duct enclosure assemblies specifically evaluated for such purpose in accordance with UL 2221. Duct penetrations shall be protected with a through-penetration firestop system ~~classified~~ tested and *listed* in accordance with ASTM E 814 or UL 1479 and having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. ~~Such assemblies~~ The grease duct enclosure assembly and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions.

Add referenced standard to Chapter 15 as follows:

UL 1479-03 Standard for Fire Tests of Through-Penetration Firestops

Reason: There is a lot of confusion regarding the options for enclosing a commercial kitchen grease duct in the code community due to the current wording of section 506.3.11. The general requirements are mixed in with the specific requirements for the three construction options and the wording does not accurately define how these products are tested and listed. The focus of this effort is to combine common requirements in the first paragraph, clearly delineate which requirements apply to each of the three construction options and to clarify the wording to accurately reflect how these products are tested, listed and labeled.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [UL 1479-03] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M92-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11-M-EUGENE.DOC

M93–12
506.3.11.1

Proponent: Vickie J. Lovell, Intercode Incorporated, representing 3M Company (vickie@intercodeinc.com)

Revise as follows:

506.3.11.1 Shaft enclosure. Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed by a listed and labelled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. ~~in accordance with the *International Building Code* requirements for shaft construction.~~ Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration in accordance with the *International Building Code* Section 714 and vented to the outside of the building through the use of weather-protected openings.

Reason: The IBC requirements for shaft construction cover many items, but the construction of a fire-resistance shaft that conform to ASTM E119 do not address fire conditions for grease duct enclosures at all.

The use of a grease duct enclosure installed in conformance with the IBC requirements for shaft construction should meet the same performance as any other "field-applied" grease duct enclosure system, and should be subjected to the same test conditions as any other field-applied grease duct enclosure system.

The ASTM E2336 test methods evaluate the enclosure materials and the grease duct enclosure systems using the following test methods: noncombustibility, fire resistance, durability, internal fire, and fire-engulfment with a through-penetration fire stop.

The proposed revisions to 506.3.11.1 do not preclude the use of gypsum boards or any other material to form a grease duct enclosure, but ensures that it will be assembled in a configuration that has been demonstrated to provide adequate protection necessary to contain a grease duct fire.

Cost Impact: The code change proposal will not increase the cost of construction.

M93-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11-M-LOVELL.DOC

M94–12
506.3.11.1

Proponent: Vickie Lovell, InterCode Incorporated representing the 3M Company (vickie@intercodeinc.com)

Revise as follows:

506.3.11.1 Shaft enclosure. Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (76 mm). <u>The materials used to form such enclosures shall be limited to an assemblage of materials that can withstand temperatures that exceed 125ºF (52ºC) for the time period of the fire-resistance rating of the floor or roof assembly penetrated.</u> Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

Reason: The historical practice of allowing certain materials, such as gypsum wallboard, to be used to enclose grease ducts serving Type 1 hoods is in consistent with the requirements for field applied, and factory built grease duct enclosures. The IBC requirements for shaft construction cover many items, but the fire-resistance requirements to conform to ASTM E119 do not address normal service conditions for grease ducts at all.

As written, any assembly of gypsum board would be permitted as a grease duct enclosure. Section 602.2 of the IMC has, for many years, recognized the practical limitations of using gypsum wallboard in elevated temperature applications.

In the IMC 602.2. the use of gypsum boards to form plenums is limited to conditions where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained.

Grease duct fires are typically very hot, exceeding the capability of a single layer of 5/8 inch gypsum board without some specific instruction on how it should be configured to provide adequate fire protection, including internal and external fire exposure for the duration and at the expected temperatures of a grease fire.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

M94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11.1-M-LOVELL.DOC

M95–12
506.3.11.2

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association; Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

506.3.11.2 Field-applied grease duct enclosure Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a field-applied grease duct enclosure that is a listed and labeled material, system, product or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336.

The surface of the duct shall be continuously covered on all sides <u>with two layers of field applied grease duct enclosure material, </u>from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire stop system classified in accordance with ASTM E 814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions. Partial application of a field applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct wrap systems shall be protected where subject to physical damage

Reason: As with many Standards, some of the pertinent language is not included in code text forcing the user to locate the Standard which may not be available or possibly even having to purchase it. In order to satisfy ASTM E 2336, two layers of wrapping material must be installed. This is extremely important information that the user needs to be aware of ahead of time, not only for bidding purposes but in order to pass an inspection the fist time around. Inspectors also need this information so they know what to look for. Although the manufacturer’s instructions require the two layers, this is simply a benefit for the user as this will aid on the front side of a possible installation.

Cost Impact: None

M95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.3.11-2-M-GRACE-MCMANN.DOC

M96–12
506.4.1.1 (New), 505.1.1 (New)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY COMMITTEE, SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

506.4.1.1 Duct Penetrations. Fire dampers, combination fire/smoke dampers and ceiling radiation dampers are not required in exhaust ducts serving Type II hoods. Ducts that penetrate fire-resistance-rated assemblies and that are not required by this section to have dampers shall comply with the requirements of Sections 714.2 through 714.3.3 of the *International Building Code.* Ducts that penetrate horizontal assemblies and that are not required to be contained within a shaft and not required by this section to have dampers shall comply with the requirements of Sections 714.4 through 714.4.2.2 of the *International Building Code.*

505.1.1 Duct Penetrations. Fire dampers, combination fire/smoke dampers and ceiling radiation dampers are not required in domestic kitchen hood exhaust ducts. Ducts that penetrate fire-resistance-rated assemblies and that are not required by this section to have dampers shall comply with the requirements of Sections 714.2 through 714.3.3 of the *International Building Code.* Ducts that penetrate horizontal assemblies and that are not required to be contained within a shaft and not required by this section to have dampers shall comply with the requirements of Sections 714.4 through 714.2.2 of the *International Building Code.*

Reason: Exception # 5 to Section 717.5.3 (IMC [B]607.5.5) addresses kitchen exhaust ducts but does not identify whether this means Type I, Type II, domestic or all of these. Rather than trying to revise the IBC text, the committee decided to let the exception apply broadly to all kitchen exhaust ducts without limitation and address the penetration protection requirements in the relative location in the IMC. For Type I kitchen exhaust ducts, dampers are not required, as was the probable intent of exception # 5. Such ducts are required to be enclosed in rated enclosures by Section 506.3.11. Because Type II and domestic exhaust ducts are not required to enclosed, some form of penetration protection would be required, therefore the proposed new text requires protection in accordance with the IBC, such as through-penetration firestop systems.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M96-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.4.1.1-M-STRAUSBAUGH.PMGCAC.DOC

M97–12
506.5.1.1 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new text as follows:

506.5.1.1 In line fan Location. Where enclosed duct systems are connected to in line fans, the fan shall be located in a room or space having the same fire resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of fan components. Such rooms or spaces shall be ventilated in accordance with the fan manufacturers' installation instructions.

Reason: Currently there is no guidance in the IMC as to how and where an in-line fan is to be located as these types of fans are usually in unique locations. Fans cannot be treated the same way as ducts as far as ratings are concerned. Fans cannot be wrapped with duct wrap material. This proposal would require the fan be installed in a rated room or a rated enclosure when the ducts attached to the fan are required to be protected. The rated rooms or enclosures may need to be ventilated according to the fan manufacturers' instructions. This language is consistent with NFPA-96.

Cost Impact: This may or may not increase cost.

M97-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.5.1.1(NEW)-MCMANN.DOC

M98–12
506.5.1.1(NEW)

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association

Add new text as follows:

506.5.1.1 In line fan Location. Where enclosed duct systems are connected to in-line fans, such fans shall be located in a room, space or enclosure having the same fire-resistance rating as the duct enclosure.

Reason: Currently there is no guidance in the IMC as to how and where an in-line fan is to be located as these types of fans are usually in unique locations. There is a misconception that the fan itself has to be in some kind of an enclosure itself which it does not, just be located in a rated room. This language is consistent with NFPA-96.

Cost Impact: None

M98-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.5.1.1-M-GRACE.DOC

M99–12
506.5.1.2(NEW), 507.2

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2. Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

> **Exception:** Where cooking appliances are equipped with integral down draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application, ~~in accordance with NFPA 96~~, a hood shall not be required at or above them.

<u>**506.5.1.2 Down draft cooking appliances and ventilation systems.** Down draft cooking appliances and ventilation systems shall be installed in accordance with the manufacturer's instructions and shall comply with all of the following requirements:</u>

1. <u>Exhaust ducts shall comply with Section 506.</u>
2. <u>Clearances to combustibles shall be in accordance with the manufacturer's listing.</u>
3. <u>Appliances shall be provided with filters complying with UL 1046.</u>
4. <u>Spaces containing such appliances shall be provided with makeup air complying with Section 508.</u>
5. <u>Appliances shall be interlocked with the exhaust system such that they cannot operate unless the exhaust system and makeup air system are operating.</u>
6. <u>The exhaust system shall be provided with controls that will prevent appliance operation when airflow falls below 25% of the normal operating flow rate or 10% below the exhaust air flow specified in the equipment listing, whichever is lower.</u>
7. <u>The ventilation system shall be capable of capturing and containing the effluent at the source</u>

Reason: It's not a good practice to send the user to another Standard only to be confused by the different language and requirements that are not in the IMC. The IMC has all the pertinent information required for safe installations.

Currently the code is silent and provides no guidance on what to expect when code officials come across these types of appliances (Hibachi Tables). The National Standard contains requirements that are not present in the code and needs to be addressed. These appliances usually involve bottom discharge exhaust systems that may need monitoring to maintain capture and containment as they are not required to have type I hoods over them.

Cost Impact: None

M99-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.5.1.2(NEW)-M-MCCANN.DOC

M100–12
506.5.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) and Richard Grace, Fairfax County Government, The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association

Revise as follows:

506.5.3 Exhaust fan mounting ~~An~~ Up-blast fans serving Type I hoods and installed in a vertical or horizontal position shall be hinged, ~~and~~ supplied with a flexible weatherproof electrical cable to permit inspection and cleaning and shall be equipped with a means of restraint to limit the swing of the fan on its hinge. The ductwork shall extend a minimum of 18 inches (457 mm) above the roof surface.

Reason: Some clarification is needed in distinguishing between Type I fans and all others. Type II fans and other types of up-blast fans do not require hinges. There needs to be some method of restraint on hinged fans as they can become quite large and heavy. If one was to get loose from a grip the potential for damage from the fan falling in an opposite direction becomes high. This could result in damage to the electrical cable on the roof, wall or elsewhere. Also, the fan could tear itself off the curb altogether. In any case, property damage or personal injury could result. A restraining cable will aid in stabilizing the fan so cleaning and maintenance operations can be accomplished safely.

Cost Impact: Adding a cable may increase the cost of the fan.

M100-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

506.5.3-M-GRACE-MCMANN.DOC

M101–12
507

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

SECTION 507
COMMERCIAL KITCHEN HOODS

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. ~~Commercial kitchen exhaust hood systems shall operate during the cooking operation.~~

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. ~~507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15.~~
2. Factory-built commercial cooking recirculating systems that are listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. ~~507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15~~. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m2).
3. ~~Net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.~~
3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.

507.1.1 Operation. Commercial kitchen exhaust hood systems shall operate during the cooking operation. The hood exhaust rate shall comply with the listing of the hood or shall comply with Section 507.5. ~~Type I~~ Hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

The net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

~~**507.2 Where required.** A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2.1 and 507.2.2. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.~~

> ~~**Exception:** Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.~~

507.1.23 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2 and 507.3.

507.1.3 Fuel-burning appliances. Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the *appliance* vents.

507.1.4 Cleaning. A hood shall be designed to provide for thorough cleaning of the entire hood.

507.1.5 Exhaust outlets. Exhaust outlets located within the hood shall be located so as to optimize the capture of particulate matter. Each outlet shall serve not more than a 12-foot (3658 mm) section of hood.

507.2~~.1~~ Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty*, *heavy-duty* and *extra-heavy duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke.

> **Exception:** A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m3/s) in accordance with Section 17 of UL 710B.

~~**507.2.1.1 Operation.** Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other *approved* methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.~~

507.2.1~~.2~~ Type I exhaust flow rate label. Type I hoods shall bear a label indicating the minimum exhaust flow rate in cfm per linear foot (1.55 L/s per linear meter) of hood that provides for capture and containment of the exhaust effluent for the cooking appliances served by the hood, based on the cooking appliance duty classifications defined in this code.

507.2.2 Type I extra-heavy-duty. Type I hoods used over *extra-heavy-duty cooking appliances* shall not cover *heavy-*, *medium-* or *light-duty appliances*. Such hoods shall discharge to an exhaust system that is independent of other exhaust systems.

507.2.3 Type I materials. Type I hoods shall be constructed of steel having a minimum thickness of 0.0466 inch (1.181 mm) (No. 18 gage) or stainless steel not less than 0.0335 inch [0.8525 mm (No. 20 MSG)] in thickness.

507.2.4 Type I supports. Type I hoods shall be secured in place by non-combustible supports. All Type I hood supports shall be adequate for the applied load of the hood, the unsupported ductwork, the effluent loading and the possible weight of personnel working in or on the hood.

507.2.5 Type I joints, seams and penetrations. External hood joints, seams and penetrations for Type I hoods shall be made with a continuous external liquid-tight weld or braze to the lowest outermost perimeter of the hood. Internal hood joints, seams, penetrations, filter support frames and other appendages attached inside the hood shall not be required to be welded or brazed but shall be otherwise sealed to be grease tight.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.
2. Internal welding or brazing of seams, joints and penetrations of the hood shall not be prohibited provided that the joint is formed smooth or ground so as to not trap grease, and is readily cleanable.

507.2.6 Clearances for Type I hood. A Type I hood shall be installed with a *clearance* to combustibles of not less than 18 inches (457 mm).

Exception: *Clearance* shall not be required from gypsum wallboard or 1/2-inch (12.7 mm) or thicker cementitious wallboard attached to noncombustible structures provided that a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the gypsum or cementitious wallboard over an area extending not less than 18 inches (457 mm) in all directions from the hood.

507.2.7 Type I hoods penetrating a ceiling. Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with Section 506.3.11. Field-applied grease duct enclosure systems, as addressed in Section 506.3.11.2, shall not be utilized to satisfy the requirements of this section.

507.2.8 Type I grease filters. Type I hoods shall be equipped with grease filters listed and labeled in accordance with UL 1046 and designed for the specific purpose. Grease-collecting *equipment* shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.2.8.

TABLE 507.2.8
MINIMUM DISTANCE BETWEEN THE LOWEST EDGE OF A GREASE FILTER AND THE COOKING SURFACE OR THE HEATING SURFACE

Type of Cooking Appliances	Height Above Cooking Surface (feet)
Without exposed flame	0.5
Exposed flame and burners	2
Exposed charcoal and charbroil type	3.5

For SI: 1 foot = 304.8 mm.

507.2.8.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or *approved*. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.

507.2.8.2. Mounting position of grease filters. Filters shall be installed at an angle of not less than 45 degrees (0.79 rad) from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.

507.2.9 Grease gutters for Type I hood. Grease gutters shall drain to an *approved* collection receptacle that is fabricated, designed and installed to allow access for cleaning.

507.3~~2.2~~ Type II hoods. Type II hoods shall be installed above dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all appliances that produce products of *combustion* and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00033 m3/s). For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [.00356 m3/(s · m2)].

> ~~**507.2.3 Domestic cooking appliances used for commercial purposes.** Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2.~~
>
> ~~**507.2.4 Extra-heavy-duty.** Type I hoods for use over *extra-heavy-duty cooking appliances* shall not cover *heavy-*, *medium-* or *light-duty appliances*. Such hoods shall discharge to an exhaust system that is independent of other exhaust systems.~~

~~**507.3 Fuel-burning appliances.** Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the *appliance* vents.~~

~~**507.4 Type I materials.** Type I hoods shall be constructed of steel having a minimum thickness of 0.0466 inch (1.181 mm) (No. 18 gage) or stainless steel not less than 0.0335 inch [0.8525 mm (No. 20 MSG)] in thickness.~~

507.3.1~~5~~ Type II hood materials. Type II hoods shall be constructed of steel having a minimum thickness of 0.0296 inch (0.7534 mm) (No. 22 gage) or stainless steel not less than 0.0220 inch (0.5550 mm) (No. 24 gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/m2) or of other *approved* material and gage.

507.3.2~~6~~ Type II Supports. ~~Type I hoods shall be secured in place by non-combustible supports.~~ All ~~Type I and~~ Type II hood supports shall be adequate for the applied load of the hood, the unsupported ductwork, the effluent loading and the possible weight of personnel working in or on the hood.

~~**507.7 Hood joints, seams and penetrations.** Hood joints, seams and penetrations shall comply with Sections 507.7.1 and 507.7.2.~~

~~**507.7.1 Type I hoods.** External hood joints, seams and penetrations for Type I hoods shall be made with a continuous external liquid-tight weld or braze to the lowest outermost perimeter of the hood. Internal hood joints, seams, penetrations, filter support frames and other appendages attached inside the hood shall not be required to be welded or brazed but shall be otherwise sealed to be grease tight.~~

~~**Exceptions:**~~

1. ~~Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.~~
2. ~~Internal welding or brazing of seams, joints and penetrations of the hood shall not be prohibited provided that the joint is formed smooth or ground so as to not trap grease, and is readily cleanable.~~

507.3.3~~7.2~~ Type II hoods joint, seams and penetrations. Joints, seams and penetrations for Type II hoods shall be constructed as set forth in Chapter 6, shall be sealed on the interior of the hood and shall provide a smooth surface that is readily cleanable and watertight.

~~**507.8 Cleaning and grease gutters.** A hood shall be designed to provide for thorough cleaning of the entire hood. Grease gutters shall drain to an *approved* collection receptacle that is fabricated, designed and installed to allow access for cleaning.~~

~~**507.9 Clearances for Type I hood.** A Type I hood shall be installed with a *clearance* to combustibles of not less than 18 inches (457 mm).~~

> ~~**Exception:** *Clearance* shall not be required from gypsum wallboard or 1/2-inch (12.7 mm) or thicker cementitious wallboard attached to noncombustible structures provided that a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the gypsum or cementitious wallboard over an area extending not less than 18 inches (457 mm) in all directions from the hood.~~

~~**507.10 Hoods penetrating a ceiling.** Type I hoods or portionsthereof penetrating a ceiling, wall or furred space shall comply with Section 506.3.11. Field-applied grease duct enclosure systems, as addressed in Section 506.3.11.2, shall not be utilized to satisfy the requirements of this section.~~

~~**507.11 Grease filters.** Type I hoods shall be equipped with grease filters listed and labeled in accordance with UL 1046 and designed for the specific purpose. Grease-collecting *equipment* shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.~~

~~TABLE 507.11~~
~~MINIMUM DISTANCE BETWEEN THE LOWEST EDGE OF A GREASE FILTER AND THE COOKING SURFACE OR THE HEATING SURFACE~~

~~**Type of Cooking Appliances**~~	~~**Height Above Cooking Surface (feet)**~~
~~Without exposed flame~~	~~0.5~~
~~Exposed flame and burners~~	~~2~~
~~Exposed charcoal and charbroil type~~	~~3.5~~

~~For SI: 1 foot = 304.8 mm.~~

~~**507.11.1 Criteria.** Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or *approved*. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.~~

~~**507.11.2 Mounting position.** Filters shall be installed at an angle of not less than 45 degrees (0.79 rad) from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.~~

507.4 Hood size and location. Hoods shall comply with the overhang, set back and height requires in accordance with Sections 507.4.1 and 507.4.2 based on the type hood.

507.4.1 ~~12~~ Canopy hoods. The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the *appliance* on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the *appliance* side by a noncombustible wall or panel.

507.4.2 ~~14~~ Noncanopy hoods. Noncanopy-type hoods shall be located a maximum of 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back a maximum of 1 foot (305 mm) from the edge of the cooking surface.

507.5 ~~13~~ Capacity of hoods. Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.5~~13~~.1 through 507.5~~13~~.5. The net quantity of *exhaust air* shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of *heavy-duty*, *medium-duty* and *light-duty cooking appliances* are utilized under a single hood, the exhaust rate required by this section for the heaviest duty *appliance* covered by the hood shall be used for the entire hood.

507.5~~13~~.1 Extra-heavy-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *extra-heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	Not allowed
Double island canopy (per side)	550
Eyebrow	Not allowed
Single island canopy	700
Wall-mounted canopy	550

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.2 Heavy-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	400
Double island canopy (per side)	400
Eyebrow	Not allowed
Single island canopy	600
Wall-mounted canopy	400

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.3 Medium-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *medium-duty cooking appliances* shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.4 Light-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *light-duty cooking appliances* and food service preparation shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	250
Double island canopy (per side)	250
Eyebrow	250

Single island canopy	400
Wall-mounted canopy	200

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.5 Dishwashing appliances. The minimum net airflow for Type II hoods used for dishwashing appliances shall be 100 CFM per linear foot of hood length.

Exception: Dishwashing appliances and *equipment* installed in accordance with Section 507.3~~2.2~~.

~~**507.14 Noncanopy size and location.** Noncanopy-type hoods shall be located a maximum of 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back a maximum of 1 foot (305 mm) from the edge of the cooking surface.~~

~~**507.15 Exhaust outlets.** Exhaust outlets located within the hood shall be located so as to optimize the capture of particulate matter. Each outlet shall serve not more than a 12-foot (3658 mm) section of hood.~~

507.6~~16~~ Performance test. A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving *commercial cooking appliances*. The test shall verify the rate of exhaust airflow required by Section 507.5~~13~~, makeup airflow required by Section 508 and proper operation as specified in this chapter. The permit holder shall furnish the necessary test *equipment* and devices required to perform the tests.

507.6~~16~~.1 Capture and containment test. The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all appliances under the hood at operating temperatures, with all sources of outdoor air providing *makeup air* for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as with smoke candles, smoke puffers, etc.

Reason: This section needs to be reorganized. The scope of this section has become much too large and non-cohesive due to multiple "tweaks" in the past. Requirements are "jumbled" and bounce around between the different types of hoods. There has been no change to intent in this proposed reorganization, only the presentation of the text has changed.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M101-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.M-STRAUSBAUGH.PMGCAC.DOC

M102–12
507

Proponent: Steve Ferguson, American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE)

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section, shall be listed and labeled in accordance with UL 710 or 710 B as applicable and shall be installed in accordance with Section 304.1. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exception~~s~~:

~~1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15.~~

~~2. Factory-built commercial cooking recirculating systems that are listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).~~

~~3~~1 Net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

507.1.1 Kitchen ventilation. Spaces in which factory-built commercial cooking recirculating systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).

Delete sections without substitution as follows:

~~**507.4**~~
~~**507.5**~~
~~**507.7**~~
~~**507.11**~~
~~**507.12**~~
~~**507.13**~~
~~**507.14**~~
~~**507.15**~~

Reason: ASHRAE standard 154 no longer recognizes unlisted hoods. This proposal makes the IMC parallel with 154 and simplifies it by eliminating the code coverage for unlisted hoods and eliminates the confusion created by the 2 exceptions to Section 507.1 that exempt listed hoods from much of the current code requirements.

Cost Impact: There is some cost impact of requiring listed Type I hoods but this is offset by additional energy savings since listed hoods operate at a lower airflow rate and are more energy efficient than unlisted hoods.

M102-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.1-M-FERGUSON.DOC

M103–12
507.2.1.1.1(NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) and Roger Harper, Louisa County, VA, representing VA. Plumbing and Mechanical Inspectors Association (VPMIA)

Revise as follows:

507.2.1.1.1 Multiple hoods utilizing a single exhaust system. Where heat or radiant energy sensors are utilized in hood systems consisting of multiple hoods served by a single exhaust system, such sensors shall be provided in each hood. Sensors shall be capable of being accessed from the hood outlet or from a cleanout location.

(Renumber subsequent section)

Reason:
Harper-Utilizing heat sensors to activate the exhaust hood is only effective if the sensors are placed in an appropriate location. Having sensors installed in a duct system, downstream of the cooking appliances, affects the time in which the hood will activate and will not be consistent with the intent of 507.2.1.1. Locating a sensor in the exhaust outlet of each hood will assure timely fan activation.

McMann-Having sensors installed elsewhere in a duct system affects the time in which the hood will activate and will not be consistent with the intent of 507.2.1.1. For example, 5 hoods on a single fan system where the sensor is located in a trunk duct downstream of 5 branches. The heat from the hood farthest away will take some time to reach the sensor under passive conditions if it makes it there at all under a light load. Its possible that reverse flow may occur under negative building pressure. Locating a sensor in the exhaust outlet of each hood will assure timely fan activation.

Sensors require periodic cleaning and access is required to the inside to the duct to mount them or replace then. Provisions need to be made for these operations. Installing a sensor on a non-factory made cleanout is a excellent solution or simply providing nearby works as well.

Cost Impact: This may increase cost.

M103-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

M103-507.2.1.1.1(NEW)-M-MCMANN-HARPER.DOC

M104–12
507.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2 Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. <u>Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust equipment and makeup air system shall comply with the requirements of Sections 506, 507, 508 and 509.</u>

Reason: The code allows a Type I hood to be installed where the installation is required to have a Type II hood. The problem with replacing a Type II hood with a Type I is that the building can change hands and cooking operations can commence legally without triggering a permit. A Type I hood substituted for a Type II can be fitted with lesser gage duct with no thought to clearances and when a new tenant comes in, they see a Type I hood and start cooking items that produce grease and smoke, not understanding what's really above the ceiling. This situation provides a false sense of security for owners, tenants and code officials and this can lead to significant hazards down the road. If Type I hoods are installed, they should be installed with all of the materials and requirements that are associated such an installation. Installing a Type I hood without Type I ducts, clearances, etc is analogous to installing fire sprinkler heads without a water supply.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M104-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.2-M-STRAUSBAUGH.PMGCAC.DOC

M105–12

507.2.1, 507.2.1.3 (NEW), 507.2.2, 507.2.2.1, TABLE 507.2.1, TABLE 507.2.2.1, 507.2.2.2, TABLE 507.2.2.2

Proponent: Steve Ferguson, American Society of Heating Refrigerating and Air-Conditioning Engineers

Revise as follows:

507.2.1 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty*, *heavy-duty* and *extra-heavy-duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke. The duty classifications of cooking appliances served by Type I hoods shall be in accordance with Table 507.2.1

> **Exception:** A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with Section 17 of UL 710B.

507.2.1.3. Type I hoods shall overhang the appliances and equipment in accordance with their listing.

TABLE 507.2.1
APPLIANCE DUTY CLASSIFICATIONS BY APPLIANCE TYPE

Appliance Description	Size	Type I Hoods			
		Light Duty	Medium Duty	Heavy Duty	Extra-Heavy Duty
Braising pan/tilting skillet, electric	All	●	_	_	_
Oven, rotisserie, electric and gas	All	●	_	_	_
Oven, Combi, electric and gas	All	●	_	_	_
Oven, convection, full-size, electric and gas	All	●	-	-	-
Oven, convection, half-size, electric and gas [protein cooking]	All	●	-	-	-
Oven, deck, electric and gas	All	●	_	_	_
Oven, mini-revolving rack, electric and gas	All	●	-	-	-
Oven, rapid cook, electric	All	●	_	_	_
Oven, rotisserie, electric and gas	All	●	_	_	_
Range, discrete element, electric (with or without oven)	All	●	-	-	-
Salamander, electric and gas	All	●	_	_	_
Braising pan/tilting skillet, gas	All	_	●	_	_
Broiler, chain conveyor, electric	All	_	●	_	_
Broiler, electric, under-fired	All	_	●	_	_
Conveyor oven, electric	6 kW or larger	_	●	_	_
Conveyor oven, gas	All	_	●	_	_
Fryer, doughnut, electric and gas	All	_	●	_	_
Fryer, kettle, electric and gas	All	_	●	_	_
Fryer, open deep-fat, electric and gas	All	_	●	_	_
Fryer, pressure, electric and gas	All	_	●	_	_
Griddle, double-sided, electric and gas	All	_	●	_	_

Appliance Description	Size	Type I Hoods			
		Light Duty	Medium Duty	Heavy Duty	Extra-Heavy Duty
Griddle, flat, electric and gas	All	-	•	-	-
Range, cook-top, induction	All	-	•	-	-
Range, open-burner, gas (with or without oven)	All	-	•	-	-
Range, hot top, electric and gas	All	-	•	-	-
Broiler, chain conveyor, gas	All	-	-	•	-
Broiler, electric and gas, over-fired (upright)	All	-	-	•	-
Broiler, gas, under-fired	All	-	-	•	-
Range, wok, gas and electric	All	-	-	•	-
Appliances using solid fuel (wood, charcoal, briquettes, and mesquite) to provide all or part of the heat source for cooking	All	-	-	-	•

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and appliances as required by Table 507.2.2. The duty classifications of cooking appliances served by Type II hoods shall be in accordance with Table 507.2.2 ~~that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system~~. Type II hoods shall be installed above all appliances that produce products of *combustion* and do not produce grease or smoke as a result of the cooking process. ~~Spaces containing cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00033 m^3/s). For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [.00356 m^3/(s □ m^2)].~~ Where hoods are not required, the additional heat and moisture loads generated by such appliances shall be accounted for in the sensible and latent loads for the HVAC system.

TABLE 507.2.2
TYPE II HOOD REQUIREMENTS BY APPLIANCE DESCRIPTION

Appliance Description	Size	Hood Not Required[a,b]	Type II Hoods[a]	
			Light Duty	Medium Duty
Cabinet, holding, electric	All	•	-	-
Cabinet, proofing, electric	All	•	-	-
Cheese-melter, electric	All	•	-	-
Coffee maker, electric	All	•	-	-
Cooktop, induction, electric	All	•	-	-
Dishwasher, under-counter, electric	All	•	-	-
Dishwasher, powered sink, electric	All	•		
Drawer Warmer, 2 drawer, electric	All	•	-	-
Egg cooker, electric	All	•	-	-
Espresso machine, electric	All	•	-	-
Grill, panini, electric	All	•	-	-
Hot dog cooker, electric	All	•	-	-
Hot plate, countertop, electric	All	•	-	-

Appliance Description	Size	Hood Not Required[a,b]	Type II Hoods[a]	
			Light Duty	Medium Duty
Ovens, conveyor, electric	< 6 kW	•		
Ovens, microwave, electric	All	•		
Ovens, warming, electric (add temp.)	All	•	-	-
Popcorn machine, electric	All	•	-	-
Rethermalizer, electric	All	•	-	-
Rice cooker, electric	All	•	-	-
Steam table, electric	All	•	-	-
Steamers, bun, electric	All	•	-	-
Steamer, compartment atmospheric, countertop, electric	All	•		
Steamer, compartment pressurized, countertop, electric	All	•		
Table, hot food, electric	All	•		
Toaster, electric	All	•	-	-
Waffle Iron, electric	All	•	-	-
Cheese-melter, gas	All	-	•	-
Dishwasher, conveyor rack, chemical sanitizing	All	-	•	-
Dishwasher, conveyor rack, hot water sanitizing	All	-	•	-
Dishwasher, door-type rack, chemical sanitizing	All	-	•	-
Dishwasher, door-type rack, hot water sanitizing	All	-	•	-
Kettle, steam jacketed, tabletop, electric, gas and direct steam	< 20 gallons	-	•	-
Oven, convection, half-size, electric and gas [non-protein cooking]	All		•	
Pasta cooker, electric	All	-	•	-
Rethermalizer, gas	All	-	•	-
Rice cooker, gas	All	-	•	-
Steamer, atmospheric, gas	All		•	
Steamer, pressurized, gas	All		•	
Steamer, atmospheric, floor-mounted, electric	All		•	
Steamer, pressurized, floor-mounted, electric	All		•	
Kettle, steam-jacketed floor mounted, electric, gas and direct steam	< 20 gallons	-	•	
Pasta cooker, gas	All	-	-	•
Smoker, electric and gas, pressurized	All	-	-	•
Steam-jacketed kettle, floor mounted, electric and gas	20 gallons or larger	-	-	•

[a]A hood shall be provided for an electric appliance if it produces 3.1×10^{-7} lb/ft^3 (5 mg/m^3) of grease or more when measured at 500 cfm (236 L/s). See Section 4.2.1.

[b]Where hoods are not required, the additional heat and moisture loads generated by such appliances shall be accounted for in the sensible and latent loads for the HVAC system.

507.2.2.1 Type II hood exhaust flow rates. The net exhaust flow rate for Type II hoods shall comply with Table 507.2.2.1. The duty level for the hood shall be the duty level of the appliance that has the highest (heaviest) duty level of all of the appliances that are installed underneath the hood according to Table 507.2.2. The net exhaust flow rate is the exhaust flow rate for a hood, minus any internal discharge makeup air flow rate.

TABLE 507.2.2.1:
TYPE II HOOD MINIMUM NET EXHAUST AIRFLOW RATES

Type of Hood	**Minimum Net Exhaust Flow Rate per Linear Hood Length in cfm/ft (L/s/m)**	
	Light Duty Equipment	**Medium Duty Equipment**
Wall-mounted Canopy	200 (310)	300 (465)
Single island	400 (620)	500 (775)
Double island (per side)	250 (388)	300 (465)
Eyebrow	250 (388)	250 (388)
Backshelf/ Pass-over	200 (310)	300 (465)

507.2.2.2 Type II hood overhang. Type II hoods shall overhang the appliances and equipment served in accordance with Table 507.2.2.2.

TABLE 507.2.2.2
MINIMUM OVERHANG REQUIREMENTS FOR TYPE II HOODS

Type of Hood	**End Overhang**	**Front Overhang**	**Rear Overhang**
Wall-mounted canopy	6 in. (154 mm)	12 in. (154 mm)	N/A
Single-island canopy	12 in. (154 mm)	12 in. (154 mm)	12 in. (154 mm)
Double-island canopy	12 in. (154 mm)	12 in. (154 mm)	N/A
Eyebrow	N/A	12 in. (154 mm)	N/A
Backshelf/ Proximity/Pass-over	6 in. (154 mm)	10 in. (254 mm) (setback)	N/A
N/A = not applicable			

Delete definitions as follows:

~~LIGHT-DUTY COOKING APPLIANCE~~
~~MEDIUM DUTY COOKING APPLIANCE~~
~~HEAVY-DUTY COOKING APPLIANCE~~
~~EXTRA-HEAVY-DUTY COOKING APPLIANCE~~

Reason: The changes presented here reflect ASHRAE Standard 154-2011. Unlisted Type I hoods have been eliminated – the reasons for this change are that Type 1 hoods have been tested for the ability to structurally not warp or fail when subjected to grease fires as well as listed hoods tend to be more energy efficient than unlisted Type I hoods. Additionally Standard 154 has classified the duty-level required for both Type 1 and Type II hoods based on ASHRAE research projects. Additionally, Standard 154 has determined whether appliances need to be classified as unhooded, requiring Type 1 hoods or requiring Type II hoods.

Cost Impact: Requiring Type I hoods and showing which appliances can be unhooded does not have a cost for the operator. Both of these actually save significant amounts of energy (and costs) by reducing the amount of exhaust air required in kitchen spaced. Additionally there are cost savings in terms of reduced fan and duct sizes.

M105-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.2.1-M-FERGUSON.DOC

M106–12
507.2.1

Proponent: Roger Harper, Louisa County, VA, representing Va. Plumbing and Mechanical Inspectors Association (VPMIA), Va. Building Code Officials Association (VBCOA), and ICC Region VII (sharper@louisa.org) and Guy McMann MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke. Type I hoods shall be installed over medium-duty, heavy-duty and extra-heavy-duty cooking appliances. ~~Type I hoods shall be installed over light-duty cooking appliances that produce grease or smoke.~~

Reason: This does nothing but create confusion for designers and code officials. By definition, light duty appliances cannot produce grease or smoke and there are no examples of what this is referring to. Does this apply to burnt toast? It's anybody's guess. If it can't be explained it should not be in the code.

Cost Impact: None

M106-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.2.1-M-HARPER-MCMANN.DOC

M107–12
507.2.1.1

Proponent: Steve Ferguson, American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE)

Revise as follows:

507.2.1.1 Operation. ~~Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other *approved* methods~~. <u>The exhaust fan serving a Type I hood shall have automatic controls that will activate the fan when any appliance that requires such Type I Hood is turned on, or a means of interlock shall be provided that will prevent operation of such appliances when the exhaust fan is not turned on. Where one or more temperature or radiant energy sensors are used to activate a Type I hood exhaust fan, the fan shall activate not more than 15-minutes after the first appliance, served by that hood, has been turned on.</u> A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

Reason: Clarification that the exhaust fan interlock is to prevent appliance operation when the exhaust fan is not on instead of preventing operation of the exhaust fan when appliance is not on. Also to recognize exhaust systems that include multiple hoods and or hood sections with multiple exhaust fans. The intent is to provide exhaust for operating appliances only. If this can be achieved with only one of multiple fans in a system then there is no need to pay the energy penalty of turning the complete system on. Also recognition that many low energy input cooking appliances require a warm-up period before any cooking may take place.

Cost Impact: None. This is already a code requirement to ensure fan operation when the appliances are in operation.

M107-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.2.1.1-M-FERGUSON.DOC

M108–12
507.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.3 Fuel-burning appliances. ~~Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the appliance vents.~~ Fuel burning appliances located in the same room or space as a Type-I or Type-II hood and not located beneath the hood shall be direct-vent appliances.

Reason: 507.3 only states that "provisions" need to be made when dealing with non-direct vent appliances but provides no guidance as to what's really required or intended. This creates confusion for the user. Non-direct vent appliances and those with draft hoods are subject to many factors, one of which is a loss in building pressure which will result in improper venting and spilling flue gases back into the space. These appliances are also in competition for air with other appliances and are no match for powered exhaust equipment such as hoods. The kitchen environment lends itself to negative pressure either by design or by accident. A perfectly balanced system usually doesn't last long as every minute detail affects the system. Limiting fuel burning appliances to direct-vent removes the risk of spillage, providing a safe environment for line staff, regardless of the kitchen pressure.

Cost Impact: This may increase cost.

M108-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.3-M-MCMANN.DOC

M109–12
507.3 (NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

507.3 Fuel-burning appliances. Vented fuel-burning appliances of other than the direct-vent type shall not be located in the same room as a kitchen exhaust hood and shall not be located in a room that opens directly into a room containing a kitchen exhaust hood.

Reason: Current Section 507.3 is very vague and provides no course of action to prevent the problem. Traditionally, this negative pressure problem has been corrected by either using direct-vent appliances or by simply not installing appliances in the same room as the hood system.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M109-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.3-M-STRAUSBAUGH.PMGCAC.DOC

M110–12
507.11

Proponent: Jay Parikh, P.E., Compliance Solutions International Inc., representing himself

Revise as follows:

507.11 Grease filters. Type I hoods shall be equipped with grease filters listed and labeled in accordance with UL 1046 ~~and designed for the specific purpose~~. Grease~~-collecting *equipment*~~ filters shall be provided with access for cleaning or replacement. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.

Reason: (1) The grease filter listed and labeled in accordance with UL 1046 is designed for the specific purpose of using it in Type I hoods in commercial cooking operations. Hence, the phrase "and designed for the specific purpose" is not needed. This phrase is a carry-over from the earlier editions of this code, when the filter listing in accordance with UL 1046 was not required. (2) "Grease filter" is a better and more appropriate term instead of the term "Grease collecting equipment" to refer to these filters, as used in the heading of this section and also in other two sentences in this section, and hence "Grease filter" should be used in the second sentence as well. (3) Some grease filters available today are not to be cleaned, but are to be disposed of when loaded with grease, and replaced with new filters. The proposed change in the second sentence addresses such filters.

Cost Impact: The code change proposal will not increase the cost of construction.

M110-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.11-M-PARIKH.DOC

M111–12
507.11.1

Proponent: Jay S. Parikh, Compliance Solutions International Inc., representing self.

Revise as follows:

507.11.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or *approved*. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. <u>Where filters are designed to be and required to be cleaned,</u> removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.

Reason: Some grease filters available today are not to be cleaned, but are to be disposed of when loaded with grease, and replaced with new filters. The proposed change addresses such filters.

Cost Impact: The code change proposal will not increase the cost of construction.

M111-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

507.11.1-M-PARIKH.DOC

M112–12
508.1.2 (NEW)

Proponent: Steve Ferguson, American Society of Heating Refrigerating and Air-Conditioning Engineers

Add new text as follows:

<u>**508.1.2 Air balance**. Design plans for a facility with a commercial kitchen ventilation system shall include a schedule or diagram indicating the design outdoor air balance. The design outdoor air balance shall indicate all exhaust and replacement air for the facility, plus the net exfiltration if applicable. The total replacement air airflow rate shall equal the total exhaust airflow rate plus the net exfiltration.</u>

Reason: The proposed text is consistent with ASHRAE 154 and the IMC is currently silent on this issue.

Cost Impact: This will not increase the cost of construction.

M112-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

508.1.2(NEW)-M-FERGUSON.DOC

M113–12
510.4, 510.5

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. ~~Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.~~

> ~~**Exception:** The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:~~
>
> 1. ~~All of the hazardous exhaust ductwork and otherlaboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.~~
> 2. ~~The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.~~
> 3. ~~Each control branch has a flow regulating device.~~
> 4. ~~Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.~~
> 5. ~~Radioisotope hoods are equipped with filtration and/ or carbon beds where required by the *registered design professional*.~~
> 6. ~~Biological safety cabinets are filtered.~~
> 7. ~~Provision is made for continuous maintenance of negative static pressure in the ductwork. Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or lammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.~~

510.5 Incompatible materials and common shafts. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

> **Exception:** The provisions of this section shall not apply tolaboratory exhaust systems where all of the following conditions apply:
>
> 1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
> 2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
> 3. Each control branch has a flow regulating device.
> 4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
> 5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
> 6. Biological safety cabinets are filtered.
> 7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.

Reason: The exception to Section 510.4 states that the provision (singular) of this section does not apply if the 7 items are met. Which provision of the three provisions in the main section is being exempted? While it appears that this was meant to apply only to the 2nd and 3rd sentences, it actually applies to the entire section. It makes no sense for the exception to negate the 1st sentence of the main section. Hazardous exhaust must always be independent of other types of exhaust.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M113-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.4.#2-M-STRAUSBAUGH.PMGCAC.DOC

M114–12
510.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exception: The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
3. Each control branch has a flow regulating device.
4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
6. Biological safety cabinets are filtered.
7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

~~Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.~~

Reason: Section 510.4, the last paragraph, conflicts with section 501.3 by implying that hazardous exhaust can be recirculated if cleaned somehow. It was never the intent to allow hazardous exhaust under Section 510 to be recirculated because the complexity of the exhaust is such that effective filtering cannot be prescribed in most cases and because it poses unacceptable risk to the occupants. Filter maintenance is also a major concern. Hazardous exhaust should always discharge to the outdoors, as was intended by this section.

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Cost Impact: None.

M114-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.4#4-M-STRAUSBAUGH.PMGCAC.DOC

M115–12
510.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

> **Exception:** The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:
>
> 1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
> 2. The hazardous exhaust ductwork manifolded together ~~within the occupied space~~ must originate within the same fire area.
> 3. Each control branch has a flow regulating device.
> 4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
> 5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
> 6. Biological safety cabinets are filtered.
> 7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.

Reason: The words "**in the occupied space**" have led to interpretation issues. Such words beg the question of what the code intends if the ducts are manifolded in an **unoccupied** space. The code is conspicuously silent on this question. If the intent is to prevent the spread of fire, smoke and hazardous contaminants from one fire area to another, the location of the manifold is irrelevant. Any manifold, regardless of location, would link the ducts and, in turn, link the fire areas in which they originate.

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Cost Impact: None

M115-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.4#3-M-STRAUSBAUGH.PMGCAC.DOC

M116–12
510.4, 510.5

Proponent: Jeremy Lebowitz, P.E., Rolf Jensen & Associates, Inc., representing himself (jlebowitz@rjagroup.com)

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exception: The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
3. <u>Hazardous exhaust ductwork originating in different fire areas and manifolded together in an unoccupied common shaft shall meet the provisions of Section 717.5.3, Exception 1.1 of the *International Building Code*.</u>
4. Each control branch has a flow regulating device.
5. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
6. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
7. Biological safety cabinets are filtered.
8. Provision is made for continuous maintenance of negative static pressure in the ductwork.

<u>**510.5 Contaminated air.**</u> Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.

(Renumber subsequent sections)

Reason: Non-laboratory hazardous exhaust is already permitted to be manifolded together in a common exhaust duct when originating from the same fire area. IMC 510.4 Exception addresses ducts acting as a direct link between different fire areas through the requirement for continuous negative pressure within the duct. The manifold location is relevant as the amount of dilution inside the shaft is far greater than outside of it. IMC 510.4 Exception should allow manifolding of hazardous exhaust ducts from different fire areas within shafts. Fire dampers are prohibited at the shaft penetration, but alternative protection can and should be provided via subducts. 2012 IBC 717.5.3 Exception 1.1 allows 22-inch subducts with continuous upward airflow in lieu of fire dampers at shaft penetrations. This code approach suggests that a subduct with continuous airflow prevents contaminants from spreading between fire areas and justifies the manifolding of hazardous laboratory exhaust from separate fire areas within shafts.

Additionally, the requirements after the exception (new section 510.5) should be broken out into a separate code section to clearly show that they apply to all hazardous exhaust systems, including laboratory exhaust systems meeting the requirements of the exception.

Cost Impact: The code change will not increase the cost of construction, as it would generally permit the use of fewer shafts throughout a given building.

M116-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.4-M-LEBOWITZ

M117–12
510.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exceptions: The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
3. Each control branch has a flow regulating device.
4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
5. Radioisotope hoods are equipped with filtration and/ or carbon beds where required by the *registered design professional*.
6. Biological safety cabinets are filtered.
7. ~~Provision is made for continuous maintenance of negative static pressure in the ductwork.~~ Each hazardous exhaust duct system shall be served by redundant exhaust fans that comply with either of the following:
   7.1 The fans shall operate simultaneously in parallel and each fan shall be individually capable of providing the required exhaust rate.
   7.2 Each of the redundant fans is controlled so as to operate when the other fan has ailed or is shut down for servicing.

(Portions of text not shown remain unchanged.)

Reason: Section 510.4, exception item #7 says nothing about how the intent is to be accomplished. Does this imply standby power, redundant fans, both? Code change M55-03/04 that put this text in the code suggests that the intent was to require redundant exhaust fans in case one fan fails or needs to be serviced.

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Cost Impact: This proposal will increase the cost of construction.

M117-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.4 #1-M-STRAUSBAUGH.PMGCAC.DOC

M118–12
510.5.5

Proponent: Dustin McLehaney, Chesterfield County, VA, Va. Plumbing and Mechanical Inspectors Association (VPMIA) And Va. Building Code Officials Association (VBCOA) and Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

510.5.5 Makeup air. Makeup air shall be provided at a rate approximately equal to the rate that air is exhausted by the hazardous exhaust system. Makeup-air intakes shall be located ~~so as to avoid recirculation of contaminated air.~~ in accordance with Section 401.4.

Reason:
McLehaney-This is editorial in nature. It removes ineffective language ("avoid") and references the appropriate code section for intakes opening locations.
McMann- This is editorial in nature and referencing the Section for intakes provides all the requirements for intake openings instead of merely addressing recirculation generically.

Cost Impact: None

M118-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.5.5-M-MCLEHANEY.DOC

M119–12
510.6.1.1(NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

<u>**510.6.1.1** Hazardous exhaust ducts that penetrate fire-resistance-rated shafts shall comply with Section 714.3.1 or 714.3.1.2 of the International Building Code.</u>

Reason: Section 510.6 prohibits Fire/Smoke dampers in hazardous exhaust ducts but section 607.5.5 says the opposite. Section 510.6.2 addresses floor/ceiling assemblies. Section 510.3 addresses fire-resistance-rated wall assemblies. Section 510.6.4 addresses fire walls. The code is silent on penetration of fire rated shaft walls.

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Cost Impact: This proposal will increase the cost of construction.

M119-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.6.1.1-M-STRAUSBAUGH.PMGCAC.DOC

M120–12
510.8

Proponent: Marcelo M. Hirschler, GBH International (gbhint@aol.com)

Delete and substitute as follows:

~~**510.8 Duct construction.** Ducts used to convey hazardous exhaust shall be constructed of *approved* G90 galvanized sheet steel, with a minimum nominal thickness as specified in Table 510.8. Nonmetallic ducts used in systems exhausting nonflammable corrosive fumes or vapors shall be *listed* and *labeled*. Nonmetallic ducts shall have a flame spread index of 25 or less and a smoke-developed index of 50 or less, when tested in accordance with ASTM E 84 or UL 723. Ducts shall be *approved* for installation in such an exhaust system. Where the products being exhausted are detrimental to the duct material, the ducts shall be constructed of alternative materials that are compatible with the exhaust.~~

510.8 Duct construction. Ducts used to convey hazardous exhaust shall be constructed of materials *approved* for installation in such an exhaust system and shall comply with one of the following:

1. Ducts shall be constructed of *approved* G90 galvanized sheet steel, with a minimum nominal thickness as specified in Table 510.8.
2. Ducts used in systems exhausting nonflammable corrosive fumes or vapors shall be constructed of nonmetallic materials that exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84 or UL 723 or that are *listed* and *labeled* for the application.
3. Where the products being exhausted are detrimental to the duct material, the ducts shall be constructed of alternative materials that are compatible with the exhaust.

Reason: This is simply editorial cleanup. The present section seems to suggest, in the first sentence, that the ducts must be constructed of galvanized sheet steel, something which the second sentence contradicts. Any material used for construction of hazardous exhaust ducts needs to be approved for the system.

Cost Impact: None

M120-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

510.8-M-HIRSCHLER.DOC

M121–12
511.3.1(NEW), 511.3.2(NEW), 511.3.3(NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

511.3.1 Ambient Temperature Noncombustible Materials. Ducts conveying noncombustible materials at ambient temperatures shall have a clearance of not less than 1/2 inch from combustible construction and a clearance not less than of 6 inches to stored combustible materials.

511.3.2 Ambient Temperature Combustible Materials. Ducts conveying combustible materials at ambient temperature shall have a clearance of not less than 18 inches from combustible construction and combustible materials.

Exceptions:

1. The required clearance shall be 6 inches from combustible materials and 1/2 inch from combustible construction where the duct system is provided for the specific hazard.
2. Where the combustible material is protected in accordance with Table M308.6. the clearances between ducts and combustible materials shall be in accordance with that table.

511.3.3 Systems Operating at Temperatures Above 100ºF. Ducts conveying materials whose temperature exceeds 100ºF (37.7ºC) shall have clearances in accordance with Table M511.3.3. All ducts shall be lined with refractory materials if the temperature of the conveyed material exceeds 900º.

TABLE 511.3.3
CLEARANCES FOR DUCTS CONVEYING MATERIALS
TEMPERATURES EXCEEDING 100ºF

Product Temperature (In Duct)	Maximum Dimension of Duct (inches)	Minimum Clearance (inches)
101º-600	Up to and including 8 Over 8	8 12
601º-900º	Up to and including 8 Over 8	18 24
901º	All ducts shall be lined with refractory material	24

Reason: Adds requirements for clearances from ducts to combustible construction.

Cost Impact: There is a cost impact.

M121-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

511.3(NEW)-M-ALLEN.DOC

M122–12
514.2

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself

Revise as follows:

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

1. Hazardous exhaust systems covered in Section 510.
2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust.
3. Smoke control systems covered in Section 513.
4. Commercial kitchen exhaust systems serving Type I and Type II hoods.
5. Clothes dryer exhaust systems covered in Section 504.

   Exception: The use of an energy recovery ventilation system design is not prohibited for the applications listed herein provided that corrosion, heat, cross-contamination and fouling are addressed through an approved engineering analysis.

Reason: There are various types of energy recovery designs on the market that can adequately address various concerns involving corrosion, heat, cross-contamination and fouling. As currently written, the language in the IMC provides no exceptions. Clearly, any energy recovery system designated for use with any of the listed systems would need to be fully thought-out and specifically engineered for the proposed system. To completely eliminate the opportunity for an engineered design, also completely eliminates the opportunity for energy recovery. The proposed language provides the authority having jurisdiction the final say on the acceptability of the proposed system based on the engineering analysis provided at the specific site in question.

Cost Impact: The code change proposal will not increase the cost of construction.

M122-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

514.2-M-DAHMEN.DOC

M123–12
514.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

> **Exception:** The application of ERV equipment that recovers sensible heat only utilizing coil-type and fixed- plate heat exchangers shall not be limited by this section.

Portions not shown remain unchanged.

Reason: Section 514 limits the applications for ERV's and was focused on wheel- type heat exchanger units. Exemptions should apply for "run-around-coils", fixed plate heat exchangers and other non- latent energy types of ERV's. The ERV types in the exception cannot leak contaminants from one air stream to another, which was the concern of the original text. ERV's are in demand for some of these applications to meet the goals of energy and sustainability "green" codes, standards and rating systems.

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Cost Impact: None

M123-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

514.2-M-STRAUSBAUGH.PMGCAC.DOC

M124–12
601.5 (New)

Proponent: Tom Allen, representing self

Add new text as follows:

601.5 Balanced Return Air. Provisions shall be made to avoid unbalanced air flows and pressure differentials caused by restricted return air where return air intakes are centrally located, pressure differentials across closed doors shall be limited to 0.01 inch WC (2.5 pascals) or less. Pressure differentials across fire walls in ceiling space plenums shall be limited to 0.01 inch WC (2.5 pascals) by providing air duct pathways or air transfer pathways from the high pressure zone to the low zone.

1. Transfer ducts that are 1½ times the cross sectional area of the supply ducts entering the room or space served combined with the door undercut of at least 1 inch shall be considered as to achieve return air balance.
2. Through-the-wall transfer grilles that have a grill area of 50 square inches per 100 cfm of supply air combined with a door undercut of at least 1 inch shall be considered as achieving return air balance.

Only habitable rooms shall be required to meet these requirements for balanced return air except that all supply air into the master suite shall be included.

Reason: Adds design and prescriptive requirements for balanced return air.

Cost Impact: There is a cost impact.

M124-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

601.5(NEW)-M-ALLEN.DOC

M125–12
602

Proponent: Steven J. Clark, P.E., Aquatherm, representing self
(steve.clark@aquathermpipe.com)

Revise as follows:

SECTION 602
PLENUMS

602.1 General. Supply, return, exhaust, relief and ventilation air <u>distribution systems shall be constructed in accordance with Section 603.</u> ~~plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical *equipment* rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a *plenum*.~~

~~**602.2 Construction.** *Plenum* enclosures shall be constructed of materials permitted for the type of construction classification of the building. The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.~~

~~**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.~~

~~**Exceptions:**~~

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603. 2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~
3. ~~This section shall not apply to materials exposed within plenums in one- and two-family dwellings.~~
4. ~~This section shall not apply to smoke detectors.~~
5. ~~Combustible materials fully enclosed within one of the following:~~
    - ~~5.1. Continuous noncombustible raceways orenclosures.~~
    - ~~5.2. Approved gypsum board assemblies.~~
    - ~~5.3. Materials listed and labeled for installation within a plenum.~~
6. ~~Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.~~

~~**602.2.1.1 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.~~

~~**602.2.1.2 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Piping shall be *listed* and *labeled*.~~

~~**602.2.1.3 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1820. Combustible pneumatic tubing shall be *listed* and *labeled*.~~

~~**602.2.1.4 Electrical equipment in plenums.** Electrical *equipment* exposed within a *plenum* shall comply with~~
~~Sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical *equipment* with metallic enclosures exposed within a *plenum* shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures.** Electrical *equipment* with combustible enclosures exposed within a *plenum* shall be *listed* and *labeled* for such use in accordance with UL 2043.~~

~~**602.2.1.5 Foam plastic insulation.** Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of Sections 602.2.1.5.1, 602.2.1.5.2 and 602.2.1.5.3.~~

~~**602.2.1.5.1 Separation required.** The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the *International Building Code* and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.2.1.5.2 Approval.** The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the *International*~~
~~*Building Code* when tested in accordance with NFPA 286.~~

~~The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the *International Building Code*.~~

~~**602.2.1.5.3 Covering.** The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.3 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized asair plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a *plenum* for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall complywith the floor penetration protection requirements of the *International Building Code*.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code*.~~
6. ~~Studwall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.~~

~~**[B] 602.4 Flood hazard.** For structures located in flood hazard areas, plenum spaces shall be located above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment or shall be designed and constructed to prevent water from entering or accumulating within the plenum spaces during floods up to such elevation. If the plenum spaces are located below the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment, they shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such elevation.~~

Reason: Purpose of Code Change – To improve the health and life safety of buildings by eliminating a major loophole that favors some HVAC systems over others.

Air plenums are often formed out of cavities within the building structure, under the assumption that eliminating ductwork saves some construction costs as well as engineering design time. This is a false economy and a poor and unsafe practice for a number of reasons:

1. Due to fires that have started or spread through plenums, numerous codes regulate the construction and materials allowed in plenums. These requirements to have everything from pipes and insulation to control wiring be “plenum rated” has driven up the costs of construction for many of the other trades on the project. These “plenum rated” materials often contain hazardous materials.
2. Plenum air systems are impossible to clean due to the type of construction and the wires, cables and pipes that are in the way. Since this is the air the occupants are breathing, this can lead to numerous health issues.
3. Plenum air systems can grow mold.

1. Plenum return air systems are not compatible with the use or return air grill filters, which keep the return air system cleaner.
2. Plenum air systems typically contain materials that can produce VOX gases that then end up in the air stream.
3. Plenum return air systems present a fire hazard, where fires can start or are drawn into, can quickly spread and are very difficult to fight.
4. The chemicals found in a plenum can produce deadly combustion gases during a fire and these deadly fumes can now be spread by the air system.
5. Plenums add considerable work load to the code enforcement community while offering no health or safety benefit.

Cost Impact: Any savings that could be gained by avoiding following the requirements for ducting air in Section 603, and instead following the loophole provided in section 602 only applies when the designer chooses to use Forced Air HVAC systems and chooses not to spend the time designing a return air system. Thermal transfer mediums other than air are for more compact and efficient at moving thermal energy around a building. (Water uses one tenth the transfer energy of air.) By hiding the cost of the forced air systems in the bids of other trades, the existing loophole acts as a misleading subsidy to forced air systems, making them appear less costly than they really are. This distorts the relative HVAC system economics, driving the market towards inefficient systems.

Most likely, the cost of buildings is far higher due to the use a plenums. Many non-HVAC building trades are impacted and forced to use more expensive materials and construction technics to meet the "plenum rated" requirements. While nearly impossible to calculate, it is doubtful that there is any net savings to the total project cost by having plenums.

There should be a substantial savings for the code enforcement community by eliminating the confusion and safety issues presented by the current loophole.

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M125-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.1-M-CLARK.DOC

M126–12
602.1

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

SECTION 602
PLENUMS

602.1 General. Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. <u>Return and transfer air shall be ducted from the boundary of the fire area directly to the air handling equipment.</u> Fuel-fired appliances shall not be installed within a plenum**.**

Reason: It needs to be clarified that protected openings connecting one fire area to another are still linking the fire areas together regardless of whether a fire damper is installed in a fire barrier. There will still be a physical path for smoke to travel through even when the equipment has stopped in fire mode. Making it clear that this situation would require a direct ducted connection to the air handling equipment will be helpful to the user.

Cost Impact: None

M126-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.1.#2-M-MCMANN.DOC

M127–12
602.1, 602.2.1, 602.3, 1104.4.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

SECTION 602
PLENUMS

602.1 General Supply, return, exhaust, relief and ventilation air plenums shall be limited to <u>under floor spaces in computer rooms, shafts</u> ~~uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces~~ and mechanical equipment rooms. <u>HVAC systems in other spaces shall be ducted.</u> Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a plenum

602.2.1 Materials within plenums. Except as required by sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
   5.1. Continuous noncombustible raceways or enclosures.
   5.2. Approved gypsum board assemblies.
   5.3. Materials listed and labeled for installation within a plenum.
6. ~~Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.~~

~~**602.3 Stud cavity and joist space plenums** Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a plenum for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the International Building Code.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by approved fireblocking as required in the International Building Code.~~
6. ~~Studwall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.~~

~~**1104.4.3 Plenums**. Where the space above a suspended ceiling is continuous and part of the supply or return air plenum system, this space shall be included in calculating the volume of the enclosed space.~~

Reason: As a result of the direction the Energy code is taking us, its time for building cavities to stop being utilized as return air plenums. Ducting the returns eliminates many problems as plenum ceiling over time become contaminated with dirt and other impurities contributing to sick building syndrome.

- Insulation cannot be effectively cleaned.

- A ducted system can be cleaned and is efficient where a ceiling really cannot be effectively cleaned.
- There are friable material issues that may lead to health problems.
- Air admittance valves could be installed in all ceilings.
- Ducts can be sealed, cleaned and tested.
- Return air temperatures can be kept down without the light and roof heat load.
- The plenum construction might not need to be as tight.
- Balancing issues exist due to low return air pressure path that doesn't effectively pull the air from rooms and make its way back to the fan.
- Mold spores can be transported from above ceiling wet area such as condensate pans, ceiling tiles, leaky pipe or utility chases, general water damage, etc. that could create a microbial habitat. This proposal limits plenums to shafts, equipment rooms and computer rooms as equipment in computer rooms are specifically designed to be used in conjunction with built up floors. This will still permit shafts in office buildings to still be employed as return air plenums and sub duct systems would not be affected either. Many systems are designed to eliminate plenums and those designs would not be affected but there could be cost increase for the balance. Eliminating 99% of plenums greatly simplifies the inspection and plan review process. Stricken language will not be required if ceiling plenums are prohibited. The elimination of the majority of plenums will need to be approved in the Mechanical Code before the other codes can be modified.

Cost Impact: This proposal may increase cost.

M127-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.1#1-M-MCMANN.DOC

M128–12
602.1

Proponent: Gary Kreutziger,M.C.P., City of San Antonio, representing Gary Kreutziger (gkreutziger@sanantonio.gov)

Revise as follows:

602.1 General. Supply, return, exhaust, relief and *ventilation air* plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical *equipment* rooms. Plenums shall be limited to one fire area <u>and one smoke compartment</u>. Fuel-fired appliances shall not be installed within a *plenum*.

Reason: With the principal cause of death in fire victims being carbon monoxide poisoning followed by carbon dioxide poisoning and/or oxygen deficiency, it should be a code priority to limit the ability for smoke to migrate from one smoke compartment to another smoke compartment. But the code does not prioritize smoke migration in the same way it does fire migration. In the same manner that fire is restricted from migrating from one fire area to another fire area by limiting plenums to one fire area, so should smoke be restricted from migrating from one smoke compartment to another smoke compartment. Transfer openings in fire barriers are required to have fire dampers and transfer openings in smoke barriers are required to have smoke dampers, however, this is where the similarity stops. If plenums are limited to one fire area, then why not also to one smoke compartment, since smoke is the principal cause of death in fire victims?

Cost Impact: The code change proposal will not increase the cost of construction.

M128-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.1#2-M-KREUTZIGER.DOC

M129–12
202, Section 602

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new definition as follows:

<u>**NON-DISCRETE PRODUCT.** Products such as conduit, cable and plastic piping systems that are tested in accordance with ASTM E84 or UL 723.</u>

Delete and substitute as follows:

~~SECTION 602~~
~~PLENUMS~~

~~**602.1 General.** Supply, return, exhaust, relief and *ventilation air* plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical *equipment* rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a *plenum*.~~

~~**602.2 Construction.** *Plenum* enclosures shall be constructed of materials permitted for the type of construction classification of the building.~~

~~The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.~~

~~**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.~~

~~Exceptions:~~

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603.~~
2. ~~Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~
3. ~~This section shall not apply to materials exposed within plenums in one- and two-family dwellings.~~
4. ~~This section shall not apply to smoke detectors.~~
5. ~~Combustible materials fully enclosed within one of the following:~~
   - ~~5.1. Continuous noncombustible raceways or enclosures.~~
   - ~~5.2. Approved gypsum board assemblies.~~
   - ~~5.3. Materials listed and labeled for installation within a plenum.~~
6. ~~Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.~~

~~**602.2.1.1 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.~~

~~**602.2.1.2 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Piping shall be *listed* and *labeled*.~~

~~**602.2.1.3 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1820. Combustible pneumatic tubing shall be *listed* and *labeled*.~~

~~**602.2.1.4 Electrical equipment in plenums.** Electrical *equipment* exposed within a *plenum* shall comply with Sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.**Electrical *equipment* with metallic enclosures exposed within a *plenum* shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures.**Electrical *equipment* with combustible enclosures exposed within a *plenum* shall be *listed* and *labeled* for such use in accordance with UL 2043.~~

~~**602.2.1.5 Foam plastic insulation.** Foam plastic insulation used as interior wall or ceiling finish, or as interior~~
~~trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of Sections 602.2.1.5.1, 602.2.1.5.2 and 602.2.1.5.3.~~

~~**602.2.1.5.1 Separation required.** The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the *International Building Code* and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.2.1.5.2 Approval.** The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the *International Building Code* when tested in accordance with NFPA 286.~~

~~The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the *International Building Code*.~~

~~**602.2.1.5.3 Covering.** The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.3 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a *plenum* for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the *International Building Code*.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code*.~~
6. ~~Studwall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.~~

~~**[B] 602.4 Flood hazard.** For structures located in flood hazard areas, plenum spaces shall be located above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant~~

~~equipment or shall be designed and constructed to prevent water from entering or accumulating within the plenum spaces during floods up to such elevation.~~

~~If the plenum spaces are located below the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment, they shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such elevation.~~

602.1 General. Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a plenum.

602.2 Construction. Plenum enclosures shall be constructed of materials permitted for the type of construction classification of the building.

The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

602.3 Materials installed within plenums. Sections 602. 3.1 through 602.3.8 shall apply to materials exposed within plenums. Such sections shall not apply to the following:

1. Dwelling units.
2. Smoke detectors.
3. Combustible materials fully enclosed within continuous noncombustible raceways or enclosures, gypsum board or other assembly meeting the fire resistive requirements of the building type of construction.
4. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

602.3.1 Rigid and flexible ducts and connectors. Rigid and flexible ducts and connectors shall conform to Section 603.

602.3.2 Duct coverings, linings, tape and connectors. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.

602.3.3 Combustible Wiring. Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.

602.3.4 Combustible fire sprinkler piping. Combustible fire sprinkler piping exposed within a plenum shall be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.

602.3.5 Combustible pneumatic tubing. Combustible pneumatic tubing exposed within a plenum shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1820.

602.3.6 Electrical equipment in plenums. Electrical equipment exposed within a plenum shall be enclosed within metallic enclosures or shall meet the requirements of UL 2043.

602.3.7 Foam plastic insulation. Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of the following:

1. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the International Building Code and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.
2. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the International Building Code when tested in accordance with NFPA 286. The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the International Building Code .
3. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

602.3.8 Non-discrete products. *Non-discrete products* not addressed in Sections 602.3.1 through 602.3.7 installed within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Reason: This section was reorganized to eliminate a format having several exceptions. New text was added to cover what was addressed in the current Section 602.2.1, which was, in essence, what the industry refers to as non–discrete products that can be tested to ASTM E 84 or UL 723.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M129-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-NON-DISCRETE PRODUCT-M-STRAUSBAUGH.PMGCAC.DOC

M130–12
602.2

Proponent: Marcelo M. Hirschler, GBH International and Robert J Davidson, Davidson Code Concepts (gbhint@aol.com)

Revise as follows:

602.2 Construction. *Plenum* enclosures shall be constructed of materials that comply with the requirements of section 703.5 of the *International Building Code* or of materials that have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723 ~~permitted for the type of construction classification of the building~~. The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

Reason: All the materials contained within a plenum must be noncombustible or have a flame spread index of not more than 25 and a smoke developed index of not more than 50, except for a series of materials that meet their own special tests. The materials of construction of the plenum itself need to meet similar requirements. The IMC section is shown below.

> **602.2.1 Materials within plenums**. Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Plenums should not be allowed to be constructed simply of combustible materials (for example plain wood) because if the plenum enclosures can be made of wood, any fire would be able to spread along the walls of the plenum (wood typically has a flame spread index of up to 200) even with the best materials contained within the plenum.

During the last cycle proposal M88 introduced this issue but the technical committee was concerned that the proposal was placed in the wrong location because the requirements were placed in section 602.2.1 and they conflicted with the requirements of section 602.2 which would appear to allow plenum enclosures to be constructed of wood or other combustible building materials.

Requiring that a material be noncombustible in accordance with Section 703.5 of the IBC is much less onerous than simply requiring it to be noncombustible because composite materials are actually permitted to be “somewhat combustible” in accordance with 703.5.2 and only “elementary materials” are required to be strictly noncombustible. In particular section 703.5.2 of the IBC is intended to allow gypsum board to be classified as noncombustible, and, therefore, this avoids a conflict with the remainder of section 602.2 that allows gypsum board into certain plenums.

Section 703.5 of the IBC reads as follows:

703.5 Noncombustibility tests. *The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2 602.3 and 602.4 in Type I, II, III and IV construction. The term “noncombustible” does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.*
703.5.1 Elementary materials. *Materials required to be noncombustible shall be tested in accordance with ASTM E 136.*
703.5.2 Composite materials. *Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 or UL 723 shall be acceptable as noncombustible materials.*

The revised language proposed for the IMC takes care of the problem of using highly combustible materials to construct plenums by requiring that plenum enclosures be constructed of noncombustible materials (in accordance with section 703.5 of the IBC, which includes gypsum board) or of materials that meet the same fire test requirements as the materials contained within the plenum for all types of buildings.

Cost Impact: Plenums will not be permitted to be constructed of wood.

M130-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2-M-HIRSCHLER.DOC

M131–12
202, 602.2.1, 602.2.1.6 (NEW), Chapter 15

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)
(mikec@cmservnet.com)

Add definition as follows:

WATER DISTRIBUTION PIPE. <u>A piping or tubing within the structure or on the premises that conveys water from the water service pipe, or from the meter when the meter is at the structure, to the points of utilization.</u>

Add text as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.~~5~~<u>6</u>, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
    5.1. Continuous noncombustible raceways or enclosures.
    5.2. Approved gypsum board assemblies.
    5.3. Materials listed and labeled for installation within a plenum.
6. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

<u>**602.2.1.6 Plastic water distribution pipe.** Plastic water distribution piping and tubing used in a pressurized wet system exposed within a plenum shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887 or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84, UL 723 or CAN/ULC S102.2</u>

Add referenced standard to Chapter 15:

<u>CAN/ULC S102.2-10</u>
<u>Standard Method of Test for Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.</u>

Reason: The intent of this proposal is to provide known and accepted test methods, such as CAN/ULC S102.2 and UL-1887, to evaluate the acceptability of combustible supply piping to be used in plenum spaces. Such piping is used for hot and cold water supply but not as drain, waste and vent piping.

This action will complement the current standard, the ASTM E-84 test method, which is available to assess flame spread properties of combustible supply piping, and provide regulators and suppliers with the improved option of the UL test method to assess production of smoke by combustible piping. We do not wish to remove ASTM E84 as a suitable test for there are existing listings.

While UL 1887 is specifically scoped for use with combustible sprinkler piping at the present time, it is my understanding from discussions with UL representatives that allowing for/requiring its utilization for combustible pressure piping, will not require modification of that standard. The membership should note that such piping is functionally equivalent to sprinkler piping in the application covered by the proposed code change.

In all cases testing according to UL 1887 is carried out on empty piping, i.e. piping NOT including water or any other liquid. This was a concern stated by the Committee in its earlier deliberations. This test condition insures that under the proposal combustible piping will be tested according to the most pessimistic scenario possible when comparing full or empty piping. This is because empty combustible piping is far more easily ignited and presents a greater smoke hazard than combustible piping that is full of water when they are compared directly.

S102.2 is referenced in the building code, and UL 1887 is already in the IMC.
The term “water distribution pipe” is already defined in the IPC.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [CAN/ULC S102.2-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M131-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2.1-M-CUDAHY.DOC

M132–12
602.2.1, Chapter 15

Proponent: Joseph Dorney, Quality Assurance Engineer, Chamberlin Rubber Company Inc., representing self (JDorney@crubber.com)

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84~~,~~ ~~or~~ UL 723, or UL 94.

Add new standard to Chapter 15 as follows:

UL 94-06 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

Reason: The UL94 fire rating test is a more rigorous and applicable standard for hydronic system hoses to be tested and rated to. This proposal would simply add this code to the list of acceptable standards for materials within plenums.

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [UL 94-06] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M132-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2.1-M-DORNEY

M133–12
602.2.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
   - 5.1. Continuous noncombustible raceways or enclosures.
   - 5.2. Approved gypsum board assemblies.
   - 5.3. Materials listed and labeled as <u>plenum protection systems</u> for use within a plenum.

Reason: This proposal aims to clarify Exception 5 to 602.2.1 which permits combustible materials to be installed in plenums provided they are fully enclosed in, amongst other things, "Materials listed and labelled for installation within a plenum." However, the current language lacks any kind of specific test standard, or detail as to the intent. Some have interpreted the exception to mean that the combustible item can be covered with *any* 25/50 rated material to bring it into code compliance. Testing has demonstrated that this is not the case. An individual material may pass the flame/smoke criteria, but may not provide enough protection for the combustible item beneath it to also pass the test. Reasons for this may include material shrinkage, high thermal conductivity, inadequate thickness, etc.

Testing and Certification Laboratories do provide Listings for "Plenum Protection Systems", which serve to protect a combustible item, keeping it from the degrading under fire conditions. These materials are qualified through fire testing of the combustible item together with the 'plenum protection material' as a system, to one of the plenum fire test methods dictated by the item type (such as NFPA 262, UL 1887, UL 1820 or UL 2024). These fire tests are a modified version of ASTM E 84 and utilise the Steiner Tunnel furnace. Testing is conducted at nationally recognised testing laboratories (NRTL) such as Intertek, ETL or UL. Listed system are then identified under the plenum protection (PP) category in the lab's Certifications Directory.

Cost Impact: This proposal will not affect the cost of construction.

M133-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2.2.1-M-CRIMI.DOC

M134–12
202, 602.2.1.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new definition as follows:

DISCRETE PRODUCT. Products such as duct straps, duct fittings, duct registers, and pipe hangers that are tested to UL 2043.

Revise as follows:

~~**602.2.1.4 Electrical equipment in plenums**. Electrical equipment exposed within a plenum shall comply with Sections 602.2.1.4.1 and 602.2.1.4.2~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical equipment with metallic enclosures exposed within a plenum shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures**. Electrical equipment with combustible enclosures exposed within a plenum shall be listed and labeled for such use in accordance with UL 2043.~~

602.2.1.4 **Discrete electrical, plumbing and mechanical products in plenums.** Where discrete electrical, plumbing and mechanical products and appurtenances are located in a plenum and have exposed combustible material, they shall be listed and labeled for such use in accordance with UL 2043.

Reason: The first part of this proposal is just a text cleanup to delete unnecessary wording. Section 602.2.1.4.1 does not state a requirement and is simply the inverse of section 602.2.1.4.2. With Section 602.2.1.4.1 gone, Section 602.2.1.4 has no purpose. The only actual requirement is stated in Section 602.2.1.4.2. The second part of this proposal revises the remaining section to broaden its coverage to more than electrical products. There are combustible plumbing and mechanical products such as plumbing appurtenances, pipe and duct supports, condensate pumps, duct fittings, etc that are used in plenums and that cannot be effectively tested in accordance with standards ASTM E84 or UL 723. The UL 2043 standard was developed to test products and materials not able to be tested in accordance with ASTM E84 or UL 723, and is currently adopted by reference in Section 602.2.1.4.2. These products are individual distinct pieces and non-continuous (i.e. “discrete”). This proposal was presented last cycle and the Committee had questions about the term “discrete’. Per the dictionary, ‘discrete’ refers to products that are non-continuous, individual distinct pieces, as compared to non-discrete products such as cable or plastic pipe. If adopted, this proposal will provide consistency in how the ICC codes treat discrete components in plenums. The new definition is necessary because of the new term. The definition basically states that a discrete product is something that is necessarily tested to UL 2043. A discrete product is defined by how it is tested.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M134-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-DISCRETE PRODUCT (NEW)-M-STRAUSBAUGH-PMGCAC.DOC

M135–12
602.2.1.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

~~**602.2.1.4 Electrical equipment in plenums.** Electrical equipment exposed within a plenum shall comply with sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical equipment with metallic enclosures exposed within a plenum shall be permitted.~~

602.2.1.4~~.2~~ Equipment in combustible enclosures. Electrical equipment with combustible enclosures exposed within a plenum shall be listed and labeled for such use in accordance with UL 2043.

Reason: Sections 602.2.1.4 and 602.2.1.4.1 are non-requirements and serve no purpose. Section 602.2.1.4.2 is the only real requirement.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M135-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2.1.4-M-STRAUSBAUGH.PMGCAC.DOC

M136–12
602.2.1.6 (NEW)

Proponent: Marcelo M. Hirschler/GBH International
(gbhint@aol.com)

Add new text as follows:

602.2.1.6 Plastic piping and tubing used in plumbing systems shall exhibit a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723. The fire test report shall indicate that the materials were tested at full width of the tunnel and without water or any other liquid in the piping or tubing during the test.

Reason: The IMC requires, in 602.2.1, that all materials within plenums must meet a flame spread index of 25 and a smoke developed index of 50 when tested to ASTM E84. However, in actual practice, many plastic piping and tubing materials are tested by filling the product with water during the test. This is neither a test in accordance with ASTM E84 nor is it adequate for the following reasons:

1. The plastic piping and tubing is listed for use in plenums and can be used with liquids other than water. For example it could be used for combustible liquids.
2. The plastic piping and tubing is not required to be held horizontally in the plenum. If the pipe is not horizontal then the water will not be retained in the pipe during use.
3. During construction and remodeling pipes are often empty.
4. Fire testing for all other products using ASTM E84 is conducted on the material to be used and not on the material with some fillings.
5. ASTM E84 requires all materials and products to be tested at full tunnel width, with only very few exceptions. Plastic piping and tubing is not one of the exceptions. The exceptions in ATM E84 are: (1) when there is a standard practice for the material (as shown in section 6.8), (2) when adhesives and trim have been listed with tests at less than full width and (3) when a specific test or application standard has been issued (as shown in Appendix X5). The relevant sections are shown below (section 6.3 and its associated subsections, section 6.8 and appendix X5).
6. Other plastic piping and tubing materials are tested without water and the comparison is inadequate if some materials are tested full of water.
7. Some materials are tested with water simply because they cannot meet the requirements otherwise.
8. If the IMC committee believes that ASTM E84 is not an appropriate test for such materials (which is a reasonable approach) a code change is needed and an alternate test must be specified because the present wording of section 602.2.1 of the IMC requires plastic piping and tubing to be tested to the ASTM E84/UL 723 test by default, without offering additional guidance on how to do the testing.

ASTM E84 section 6.3, 6.8 and Appendix X5:
6.3 The size of the test specimen shall be:
Width: between 20 and 24 in. (508 and 610 mm)
Length: 24 ft + 12 in. — 6 in.
Thickness: maximum 4 in. (101 mm).
NOTE 1 - The test apparatus is not designed for testing at thicknesses greater than 4 in. (101 mm), but has the ability to be modified if required. This is accomplished through (a) modifications to the test apparatus lid to maintain an airtight seal, and (b) the introduction, usually of additional sample/lid supports above the test apparatus ledges. Due to the composition of some materials, test results obtained at a thickness greater than 4 in. (101 mm) will potentially vary from results of a test on the same material tested at a thickness of 4 in. (101 mm) or less.
6.3.1 The test specimen shall not be required to conform to the test specimen length and width described in 6.3 when the material complies with 6.3.1.1-6.3.1.3.
NOTE 2—When tests are conducted with materials installed at less than full width, representing the end-use width, any resulting flame spread and smoke developed indices will not relate to indices obtained with the calibration material, which is tested using the specimen width described in 6.3.
6.3.1.1 Materials for which there is a standard practice to address specimen preparation and mounting with this test method shall be tested as described in the appropriate standard practice (see 6.8).
6.3.1.2 Adhesives and trim shall be permitted to be tested in the width or length, or both, specified in their listings, or as part of their conditions for being labeled, by a nationally recognized testing laboratory.
6.3.1.3 Materials and products for which there is a specific test method or application standard requiring the use of the apparatus described in Section 5 shall be permitted to be tested in accordance with that specific test method or application standard (see Appendix X5).
6.8 In addition to the above provisions, the standard practices listed below shall be used for specimen preparation and mounting of the relevant test materials. For all other products, guidance on mounting methods is provided in Appendix X1.
E2231 for pipe and duct insulation materials.
E2404 for paper, vinyl and textile wall and ceiling covering materials.
E2573 for site-fabricated stretch systems.

E2579 for the following wood products: solid board, lumber and timber products (including solid boards, lumber, timber, fingerjoined lumber, glulam, laminate wood, laminated veneer lumber and parallel strand lumber products), panel products (including fibreboard, hardboard, oriented strandboard, waferboard, and plywood panel products), decorative wood products (including fine woodwork, millwork and moulding) and shingles and shakes used as interior wall and ceiling finish and interior trim.
E2599 for reflective insulation, radiant barrier and vinyl stretch ceiling materials for building applications.
E2688 for tapes up to and including 8 in. (203.2 mm) in width.
E2690 for caulks and sealants intended to be applied up to and including 8 in. (203.2 mm) in width.

X5. SPECIFIC TEST METHODS AND APPLICATION STANDARDS
X5.1 The following standards address testing of materials in accordance with test methods that are applications or variations of this test method or apparatus.
X5.1.1 Wires and cables for use in air-handling spaces are covered by NFPA 262.
X5.1.2 Pneumatic tubing for control systems are covered by UL 1820.
X5.1.3 Combustible sprinkler piping is covered by UL 1887.
X5.1.4 Optical fiber and communications raceways are covered by UL 2024.

IMC 602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

For information also:
NFPA 90A (section on ceiling cavity plenums)
4.3.11.2.6.6 Plastic piping and tubing used in plumbing systems shall be permitted to be used within a ceiling cavity plenum if it exhibits a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, at full width of the tunnel and with no water or any other liquid in the pipe during the test.

NFPA 90A (section on raised floor plenums)
4.3.11.5.5.7 Plastic piping and tubing used in plumbing systems shall be permitted to be used within a raised floor plenum if it exhibits a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, at full width of the tunnel and with no water or any other liquid in the pipe during the test.

Cost Impact: None

M136-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2.1.6(NEW)-M-HIRSCHLER.DOC

M137–12
602.2.1.6(NEW), Chapter 15

Proponent: David W. Ash, Lubrizol Advanced Materials Inc.

Add next text as follows:

602.2.1.6 Plastic plumbing piping. Plastic plumbing piping exposed within a plenum shall have a peak optical density not greater than 0.50. an average optical density not greater than 0.15, and a flame spread index of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887 or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with CAN/ULC S102.2. Piping shall be listed and labeled.

Add referenced standard to Chapter 15:

CAN/ULC S102.2-10
Standard Method of Test for Surface Burning Characteristics of Flooring. Floor Coverings and Miscellaneous Materials and Assemblies

Reason: Currently ASTM E-84 is the required test to determine the flame and smoke properties of materials. These values then determine whether or not a material may be used within plenums. There are exceptions to this standard for those products with special criteria and those are shown in sections 602.2.1.1 through 602.2.1.5.

Since that test is specified by the IMC, all other products, including plastic plumbing pipe, must be evaluated by this test. The scope of ASTM E-84 test states that it is applicable to surfaces such as walls and ceilings. Many products that are not used in a flat form are impacted by this requirement. Obviously, a pipe's tubular shape does not correspond to a flat shape. Although an ASTM committee has been attempting to decide on a test method for pipe, to date they have not been successful. Consequently, ASTM E-84 does not provide any direction in testing a pipe.

Other test standards have been developed that do include provisions for testing pipe. These standards have been successfully used for a number of years. The UL 1887 and CAN/ULC S1 02.2 standards recognize that the appropriate way to evaluate the flame and smoke characteristics of a pipe is to test a sample in that shape. These standards provide specific direction in the testing of the pipe and do not leave the decision of what sample to test up to the manufacturer or the testing agency. The addition of these two standards to the IMC as method to evaluate plastic plumbing pipe provides a clearer direction than what the IMC currently offers.

The CAN/ULC S102.2 standard is currently referenced in the International Building Code. The UL 1887 standard is currently referenced in the International Mechanical Code.

Cost Impact: This proposal would not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [CAN/ULC S102.2-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M137-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.2.1.6(NEW)-M-ASH.DOC

M138–12
602.3.1 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

<u>**602.3.1 Dwelling stud cavity and joist space plenums prohibited**. Building framing cavities in dwelling units shall not be utilized as ducts or plenums</u>

Reason:

- This proposal brings consistency between the IMC and the residential portion of the IECC. A distinction needs to be made here that this prohibition only applies to dwellings. There is nothing in the commercial portion of the IECC to support this prohibition in commercial applications.
- These requirements still have value in non-residential applications and should not be deleted in their entirety. The new sub-section isolates the residential prohibition.

Cost Impact: None

M138-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.3.1(NEW)-M-MCMANN.DOC

M139–12
602.3

Proponent: Dustin McLehaney, Chesterfield County, VA, Va. Plumbing and Mechanical Inspectors Association (VPMIA) And Va. Building Code Officials Association (VBCOA) (MclehaneyD@chesterfield.gov)

Delete and substitute as follows:

~~**602.3 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a plenum for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the *International Building Code*.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by approved fire-blocking as required in the *International Building Code*.~~
6. ~~Stud wall cavities in the outside wall of building envelope assemblies shall not be utilized as air plenums.~~

602.3 Building cavities. Building framing cavities shall not be used as ducts or plenums.

Reason: 2012 IECC section R403.2.3 and IRC N1103.2.3 both read as follows;

Building cavities. *Building framing cavities shall not be used as ducts or plenums.*

This practice is not permitted in residential applications. There is no logical reasoning that it should be permitted in a commercial application.

Cost Impact: The code change proposal will not increase the cost of construction.

M139-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

602.3-M-MCLEHANEY.DOC

M140–12
603

Proponent: Bob Eugene, Underwriters Laboratories, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

603.4 Metallic ducts. All metallic ducts shall be constructed as specified in the SMACNA *HVAC Duct Construction Standards- Metal and Flexible or shall comply with UL181.* Flexible metallic ducts complying with UL 181 shall be listed and labeled as Class 0 or Class 1 flexible air ducts and shall be installed in accordance with Section 304.1.

> **Exception:** Ducts constructed and installed in accordance with SMACNA *HVAC Duct Construction Standards- Metal and Flexible* within single *dwelling units* shall have a minimum thickness as specified in Table 603.4

603.4.1 Minimum fasteners. Rigid Round metallic ducts constructed in accordance with SMACNA *HVAC Duct Construction Standards- Metal and Flexible* shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint.

> **Exception:** Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion so as to prevent a hinge effect.

603.5 Nonmetallic ducts. Nonmetallic ducts shall comply with UL 181, shall be ~~constructed~~ listed and labeled as ~~with~~ Class 0 or Class 1 flexible air ducts ~~material~~, and shall be ~~comply with UL 181~~ installed in accordance with Section 304.1. Fibrous duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards.* The air temperature within nonmetallic ducts shall not exceed 250ºF (121ºC).

603.6 Installation of listed and labeled air ducts. Listed and labeled air ducts shall be installed in accordance with Sections 603.6.1 and 603.6.2.

603.6.1 Air temperature. The design temperature of air to be conveyed in flexible air ducts and flexible air connectors shall be less than 250ºF (121ºC).

603.6.2 Flexible air duct and air connector clearance. Flexible air ducts and air connectors shall be installed with a minimum *clearance* to an *appliance* as specified in the *appliance* manufacturer's installation instructions.

~~**603.6 Flexible air ducts and flexible air connectors.** Flexible air ducts, both metallic and nonmetallic, shall not be limited in length. shall comply with Sections 603.6.1, 603.6.1.1, 603.6.3 and 603.6.4. Flexible air connectors, both metallic and nonmetallic, shall comply with Sections 603.6.2 through 603.6.4.~~

~~**603.6.1 Flexible air ducts.** Flexible air ducts, both metallic and nonmetallic, shall be tested in accordance with UL 181. Such ducts shall be *listed* and *labeled* as Class 0 or Class 1 flexible air ducts and shall be installed in accordance with Section 304.1.~~

~~**603.6.2.**~~ **603.7 Flexible air connectors.** Flexible air connectors, both metallic and nonmetallic, shall comply with UL 181, shall be *listed* and *labeled* as Class 0 or Class 1 flexible air connectors, and shall be installed in accordance with Section 304.1.

~~**603.6.2.1**~~ **603.7.1 Connector length.** Flexible air connectors shall be limited in length to 14 feet (4267 mm).

~~**603.6.2.2**~~ **603.7.2 Connector penetration limitations.** Flexible air connectors shall not pass through any wall, floor or ceiling.

~~**603.6.3 Air temperature.** The design temperature of air to be conveyed in flexible air ducts and flexible air connectors shall be less than 250ºF (121ºC).~~

~~**603.6.4 Flexible air duct and air connector clearance.** Flexible air ducts and air connectors shall be installed with a minimum *clearance* to an *appliance* as specified in the *appliance* manufacturer's installation instructions.~~

603.9 Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in *SMACNA HVAC Duct Construction Standards—Metal and Flexible or NAIMA Fibrous Glass Duct Construction Standards* in accordance with 603.9.1 *or* shall comply with *UL181* in accordance with Section 603.9.2. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Closure systems used to seal ductwork shall be installed in accordance with the duct and closure system manufacturer's instructions. Unlisted duct tape is not permitted as a sealant on any duct.

603.9.1 Ducts in accordance with SMACNA and NAIMA. Joints, seams and connections in metallic and nonmetallic ducts constructed as specified in *SMACNA HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards* ~~All joints, longitudinal and transverse seams and connections in ductwork~~ shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants ~~or~~ tapes, or closure systems in accordance with Section 603.9.2.

> **Exception:** Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures of less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

603.9.2 Ducts in accordance with UL 181. Closure systems used to seal ductwork in accordance with UL181 shall be listed and labeled in accordance with either UL 181A or 181B in accordance with Table 603.9.2. Closure systems used to seal rigid metallic and rigid fiberglass ducts shall comply with 181A and shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. ~~Duct connections to flanges of air distribution system *equipment* shall be sealed and mechanically fastened.~~ Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." ~~Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.~~

> ~~**Exception:** Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.~~

TABLE 603.9.2
CLOSURE SYSTEMS

Type of Ductwork	Standard	Type of Closure System	Marking
Rigid Metallic or Rigid Fiberglass	UL 181A	Pressure Sensitive Tape	181A-P
Rigid Metallic or Rigid Fiberglass	UL 181A	Mastic Tape	181A-M
Rigid Metallic or Rigid Fiberglass	UL 181A	Heat Sensitive Tape	181A–H
Flexible Air Ducts and Air Connectors	UL 181B	Pressure Sensitive Tape	181B-FX
Flexible Air Ducts and Air Connectors	UL 181B	Mastic Tape	181B-M
Flexible Non-Metallic Air Ducts	UL181B	Mechanical Fastener[a]	181B-C[a]

[a]Mechanical fasteners shall be used in conjunction with a listed pressure sensitive tape or mastic in accordance with UL181.

(Portions not shown remain unchanged.)

Reason: To provide additional clarity and consistency in the requirements air ducts constructed to SMACNA requirements and those that comply with UL181. This also provides additional clarity and consistency for the sealing of all ductwork.

Cost Impact: None

M140-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.4-M-EUGENE.DOC

M141–12
603.1.1(NEW), 603.1.2 (NEW), 603.1.3 (NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

603.1.1 Mechanical fastening. Joints between sections of air ducts and plenums, between intermediate and terminal fittings and other components of air distribution systems, and between subsections of these components shall be mechanically fastened to secure the sections independently of the closure system(s).

603.1.2 Sealing. Air distribution system components shall be sealed with approved closure systems.

603.1.3 Space provided. Space shall be provided adjacent to all mechanical components located in or forming a part of the air distribution system to provide access for construction and sealing in accordance with the requirements of Section 603.1, inspection, cleaning and maintenance. Not less than 4 inches (102 mm) of space hall be provided around air handling units.

> **Exception**: Retrofit and replacement units not part of a renovation are exempt from the minimum clearance requirement.

Reason: Adds requirements for fastening, sealing and providing space to install, inspect, and maintain ducts and plenums.

Cost Impact: There is a cost impact.

M141-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.1.1(NEW)-M-ALLEN.DOC

M142–12
603.2, 918.2

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

603.2 Duct sizing. Ducts installed within a single dwelling unit shall be sized in accordance with ACCA Manual D, the appliance manufacturer's installation instructions or other approved methods. Ducts installed within all other buildings shall be sized in accordance with the ASHRAE Handbook of Fundamentals or other equivalent computation procedure.

Revise as follows:

~~**918.2 Minimum duct sizes.** The minimum unobstructed total area of the outdoor and return air ducts or openings to a forced-air warm-air furnace shall be not less than 2 square inches per 1,000 Btu/h (4402 mm2/kW) output rating capacity of the furnace and not less than that specified in the furnace manufacturer's installation instructions. The minimum unobstructed total area of supply ducts from a forced-air warm-air furnace shall not be less than 2 square inches for each 1,000 Btu/h (4402 mm2/kW) output rating capacity of the furnace and not less than that specified in the furnace manufacturer's installation instructions.~~

> ~~**Exception:** The total area of the supply air ducts and outdoor and return air ducts shall not be required to be larger than the minimum size required by the furnace manufacturer's installation instructions.~~

918.~~3~~ 2 Heat pumps~~. The minimum unobstructed total area of the outdoor and return air ducts or openings to a heat pump shall be not less than 6 square inches per 1,000 Btu/h (13 208 mm2/kW) output rating or as indicated by the conditions of listing of the heat pump~~ Electric heat pumps shall be tested in accordance with UL 1995.

Reason: This is outdated legacy code language and is not consistent with current practice. It is up to the design professional, or the requirements from Manual D or the manufacturer of the appliances to determine minimum sizes of ducts and transfer openings, not the code. If these numbers where to be applied, then the code could be condoning an undersized system. This subject matter is already covered in 603.2. There are too many variables and different situations for just one minimum to work for everything.

Cost Impact: None

M142-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.2-M-MCMANN.DOC

M143–12
TABLE 603.4

Proponent: Luis Escobar, Air Conditioning Contractors of America, representing ACCA (luis.escobar@acca.org)

Revise as follows:

TABLE 603.4
DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS

DUCT SIZE	GALVANIZED		Appropriate Aluminum B&S Gauge ~~ALUMINUM MINIMUM THICKNESS (in.)~~
	Minimum thickness (in.)	Equivalent galvanized gauge ~~gage~~ no.	
Round ducts and enclosed rectangular ducts			
14 inches or less	0.013 ~~0.0157~~	30 ~~28~~	26 ~~0.0175~~
Over 14” ~~16 and 18 inches~~	0.016 ~~0.0187~~	28 ~~26~~	24 ~~0.018~~
~~20 inches and over~~	~~0.0236~~	~~24~~	~~0.023~~
Exposed rectangular ducts			
14 inches or less	0.016 ~~0.0157~~	28	24 ~~0.0175~~
Over 14 inches[a]	0.019 ~~0.0187~~	26	22 ~~0.018~~

For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.

~~a. For duct gages and reinforcement requirements at static pressures of ½-inch, 1-inch and 2-inch w.g., SMACNA *HVAC Duct Construction Standards*, Tables 2-1, 2-2, and 2-3, shall apply.~~

Reason: The change that was previously made in the 2009 IMC (and carried forward to the 2012 IMC) unnecessarily increased the material thickness required for round sheet metal ducts.

This proposed change seeks to return to the requirements of 2006 and previous IMC editions which have historically recognized 30 gauge sheet metal as being appropriate for round ducts 14 inches or less diameter in “Single Dwelling Units”.

The changes to table 603.4 in the 2009 IMC (and carried forward to the 2012 IMC):

1. Significantly increased cost for round sheet metal ducts
2. Did not improve safety
3. Did not improve energy performance
4. Encourages increased use of less expensive and less efficient non-metallic ducts.

Cost Impact: This code change proposal will **not** increase the cost of construction.

M143-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T603.4-M-ESCOBAR.DOC

M144–12
603.4, T603.4

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise text as follows:

603.4 Metallic ducts. All metallic ducts shall be constructed as specified in the SMACNA *HVAC Duct Construction Standards-Metal and Flexible*.

> ~~**Exception:** Ducts installed within single *dwelling units* shall have a minimum thickness as specified in Table 603.4.~~

~~**TABLE 603.4**~~
~~**DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS**~~

~~**DUCT SIZE**~~	~~**Galvanized**~~		~~**Aluminum**~~
	~~**Minimum thickness (in)**~~	~~**Equivalent galvanized gauge no.**~~	~~**Minimum thickness**~~
~~Round ducts and enclosed rectangular ducts~~			
~~14" or less~~	~~0.0157~~	~~28~~	~~0.0175~~
~~16 and 18 inch~~	~~0.0187~~	~~26~~	~~0.018~~
~~20 inch and over~~	~~0.0236~~	~~24~~	~~0.023~~
~~Exposed rectangular ducts~~			
~~14" or less~~	~~0.0157~~	~~28~~	~~0.0175~~
~~Over 14"inches[a]~~	~~0.0187~~	~~26~~	~~0..018~~

~~For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.~~
~~a. For duct gages and reinforcement requirements at static pressures of ½", 1" and 2" w.g., see SMACNA Duct Construction Standard, Tables 2-1; 2-2 and 2-3; 2005, 3rd edition.~~

Reason: The exception is of no value because the Table is not different from the Standard. The Table has no value added because it is flawed. It says that an enclosed duct of 20 inches and larger needs to be a heavier gage than exposed duct of the same size which is backwards. This Table would need to be larger and more complete in scope to be of any value and therefore should be deleted. It's easier to just check the Standard than to re-write it in Table format.

Cost Impact: None

M144-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T603.4-M-MCMANN.DOC

M145–12
603.4.2 (NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

603.4.2 Duct lap. Crimp joints for round and oval metal ducts shall be lapped not less than one inch and the male end of the duct shall extend into the adjoining duct in the direction of airflow.

Reason: Section 603.4.1 states the number of fasteners to be used for the fastening of metal ducts but is silent on how many inches the ducts must be lapped and if the ducts must be lapped in a certain direction. The code should specifically state how much lap there should be within the ducts prior to securing them as stated in Section 603.4.1.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M145-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.4.2-M-STRAUSBAUGH.PMGCAC.DOC

M146–12
603.6.1.1

Proponent: Eli P. Howard III, Sheet Metal and Air-Conditioning Contractors' National Association, Inc. (ehoward@smacna.org)

Revise as follows:

603.6.1.1 Duct length. Flexible air ducts shall ~~not~~ be limited in length to 5 feet within a single branch run.

Reason: Current practice is that flexible duct is run in such long lengths as to restrict airflow because of the higher air resistance inherent in flexible duct. Further compounding the problem, installers will use a full box (25 ft) to make a 20 ft or shorter run and this "compression" results in even higher resistance to airflow. Consider that ASHRAE's Advanced Energy Guides require the 5 foot limit in an effort to reduce fan horsepower requirements in commercial construction.

Cost Impact: Initial cost will increase modestly but energy savings will quickly offset that cost.

M146-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.6.1.1-M-HOWARD.DOC

M147–12
603.8.3

Proponent: Jim Wischhusen, Monoxivent, representing self
(jimw@monoxivent.com)

Revise as follows:

603.8.3 Plastic ducts and fittings. Plastic ducts shall be constructed ~~of PVC~~ with Class 0 or Class 1 material in accordance with UL 181 and having a minimum pipe stiffness of 8 psi (55 kPa) at 5-percent deflection when tested in accordance with ASTM D2412~~. Plastic duct fittings shall constructed of either PVC or high density polyethylene.~~ ~~Plastic duct and fittings shall be utilized in underground installations only.~~ The maximum design temperature for systems utilizing plastic duct and fittings shall be 150^{0}F (66^{0}C).

Reason: Fire, heat and smoke can readily pass through the interior of HVAC ducts constructed of any material, even if it is buried. Therefore, regardless of whether the duct is buried or not, plastic ducts should be constructed with Class 0 or Class 1 duct material in accordance with UL 181 (ref. 2009 IMC Section 603.5). Neither PVC or high-density polyethylene are Class 0 or Class 1 materials, so reference to these in this section as construction materials should be deleted. Also, if the plastic duct is constructed of a Class 0 or Class 1 material, it should not be limited to underground installations only. This proposal provides for the use of newer fire retardant materials that offer additional safety in the event of a building fire.

Cost Impact: The code change proposal will not increase the cost of construction.

M147-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.8.3#2-M-WISCHHUSEN.DOC

M148–12
603.9

Proponent: Timothy Burgos, InterCode Incorporated, representing Ductmate Industries

Revise as follows:

603.9 Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Closure systems used to seal ductwork *listed* and *labeled* in accordance with UL 181A shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system *equipment* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.

> **Exception:** Continuously welded ~~and locking-type longitudinal joints and~~ seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Reason: There is a conflict between Section 603.9 and its exception. This code change proposal removes the conflict by not allowing locking type longitudinal joints to be exempt from the sealing requirements of Section 603.9.

Section 603.9 states that all joints need to be sealed. Locking type longitudinal joints are not air tight and must be sealed, and should not be exempt from the sealing requirements found in Section 603.9. Continuously welded seams, as demonstrated in welded pipe, are considered to be air tight and therefore should be exempt from any additional sealing requirements.

Requiring locking-type longitudinal joints to be sealed in accordance with Section 603.9 will reduce the amount of air leakage from the duct, thus, increasing the energy efficiency of the duct system.

Cost Impact: The code change proposal will not increase the cost of construction.

M148-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.9-M-BURGOS.DOC

M149–12
603.9

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.9 Joints, seams and connections All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards-Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards.* All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. ~~Closure systems~~ Tapes and mastics used to seal metallic and fibrous glass ductwork shall be *listed* and *labeled* in accordance with UL 181A and shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system *equipment* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Closure systems used to seal ~~metal~~ all ductwork shall be installed in accordance with the manufacturer's ~~installation~~ instructions. ~~Unlisted duct tape is not permitted as a sealant on any duct~~.

Reason: This proposal simplifies this section by stating what is meant by "closure systems." Tapes and mastics are addressed in UL181A. There is no closure system listed specifically for metal ducts, but it is appropriate to require sealing products used for metal ducts to be listed to UL181A because if the sealing product is good enough for fibrous glass ducts it is good enough for metal ducts. This is the case in the field, as fibrous glass duct tapes are commonly used with metal ducts. The manufacturer's instructions should apply for all closure systems, not just those for metal ducts. The last sentence is unnecessary because this proposal requires all tapes to be listed, including those used with metal ducts.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M149-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.9#1-M-STRAUSBAUGH.PMGCAC.DOC

M150–12
603.9.1 (NEW), Chapter 15

Proponent: Timothy Burgos, InterCode Incorporated, Representing Ductmate Industries

Add new text as follows:

603.9.1 Duct system leak-testing. Ducts shall be installed and sealed in accordance with Section 603.9. Ducts and plenums shall be leak-tested in accordance with the SMACNA *HVAC Air Duct Leakage Test Manual* with an air leakage class (*CL*) less than or equal to 6.0 as determined in accordance with Equation 6-1.

$CL = F/P^{0.65}$ **(Equation 6-1)**

where:

F = The measured leakage rate in cfm per 100 square feet of duct surface.
P = The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

Add new referenced standard to Chapter 15 as follows:

SMACNA HVAC Air Duct Leakage Test Manual - 1985

Reason: Currently, there are no requirements for leak-testing in the International Mechanical Code. This code change proposal introduces a requirement for leak-testing all ductwork. The language for this proposal was adapted from Section C403.2.7.1.3 of the 2012 International Energy Conservation Code.

By requiring all pressure classes of ductwork to be tested, it will eliminate the confusion for a building official in determining which duct needs to be tested. Section 603.9 states the requirements of how ducts are supposed to be constructed and sealed. However, the section lacks a specific requirement in establishing a maximum air leakage rate for a duct. This proposal, if accepted, will establish these requirements by requiring all ductwork to be leak-tested in accordance with *SMACNA HVAC Air Duct Leakage Test Manual* using Equation 4-5, as noted in the section. By providing this equation, a more consistent test procedure can be established.

As new technologies are developed that increase HVAC efficiencies, it would only make sense to include requirements to improve the efficiencies of the ductwork. This proposal provides a means for the code officials to verify compliance with the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [SMACNA HVAC Air Duct Leakage Test Manual - 1985] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M150-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.9.1(NEW)-M-BURGOS.DOC

M151–12
603.9

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.9 Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Closure systems used to seal ductwork *listed* and *labeled* in accordance with UL 181A shall be marked “181A-P” for pressure-sensitive tape, “181 A-M” for mastic or “181 A-H” for heat-sensitive tape. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked “181B-FX” for pressure-sensitive tape or “181B-M” for mastic. Duct connections to flanges of air distribution system *equipment* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked “181B-C.” Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer’s installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.

> **Exception:** ~~Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems~~ For ducts having a static pressure classification of less than 2 inches of water column (500Pa), additional closure systems shall not be required for continuously welded joints and seams and locking-type joints and seams of other than the snap-lock and button-lock types.

Reason: Unless sealant or a gasket is used, snap-lock and button-lock type seams will leak significantly. The current exception attempted to prevent unnecessary sealing for joints and seams that leak very little or not at all, but it went too far by including all locking type joints and seams. Some locking joints are leakproof such as mechanically folded seams used for spiral seam duct, but this cannot be said for all locking joints.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M151-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.9-#2-M-STRAUSBAUGH.PMGCAC.DOC

M152–12
603.10

Proponent: Anthony Frank Caminita, Duct Saddle LLC., representing self
(fcaminita@ductsaddle.com)

Revise as follows:

603.10 Supports. Ducts shall be supported at intervals not to exceed 12 feet (3658mm) and shall be in accordance with SMACNA-HVAC Duct Construction Standards- Metal and Flexible. Flexible and other factory-made ducts shall be supported by a saddle <u>not less than 5.5 inches in width and shall be supported</u> in accordance with the manufacturer's instructions.

Reason: When ducts are laying on a flat surface in an attic or crawl space in a high humidity area, the bottom of the duct will condensate and drip water on to the sheet rock which will develop into stains, mold and possibly attracting tennites. The heat in the attic will dry the top part of the duct's outer jacket but cannot reach the lower part that is touching the flat surface. Also by requiring ducts to be supported with a minimum 5 %" wide support, this would prevent kinking and sagging in the duct which can lead to restriction of air flow when the duct is installed in a twisted pattern on the attic floor.

Cost Impact: The code change will add minimal cost.

M152-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.10-M-CAMINITA.DOC

M153–12
603.10

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.10 Supports. Ducts shall be supported ~~at intervals not to exceed 12 feet (3658 mm) and shall be~~ in accordance with SMACNA *HVAC Duct Construction Standards—Metal and Flexible*. ~~Flexible and other factory-made ducts shall be supported in accordance with the manufacturer's instructions.~~

Reason: This section should just reference the SMACNA standards as opposed to specifying a support interval. The 12 foot interval requirement is too broad and is inappropriate for many sizes and types of ducts . Many ducts require closer supports. This text could be easily interpreted as allowing 12 feet maximum support intervals for all ducts.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal could increase the cost of construction.

M153-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.10-M-STRAUSBAUGH.PMGCAC.DOC

M154–12
603.12

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.12 Condensation. Provisions shall be made to prevent the formation of condensation on the exterior <u>and interior surfaces</u> of any duct.

Reason: Ducts such as toilet and kitchen exhaust and clothes dryer exhaust that are run in unconditioned spaces will be subject to the formation of condensation on the inside of the duct. It is common for exhaust ducts in ventilated attics to fill with water in low points and become blocked and/or leak into the exhaust fan or dryer. Condensation can also form in HVAC ducts where humid indoor air passes through such ducts that are chilled in unconditioned spaces. External insulation combined with a vapor barrier can prevent condensation on the outside of ducts and that same insulation with or without a vapor barrier can also prevent condensation on the inside of a duct, except for when the airflow initially starts. When the duct temperature comes up to the temperature of the air within it, the condensation will stop and the initial condensation will evaporate.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M154-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

603.12-M-STRAUSBAUGH.PMGCAC.DOC

M155–12
202, 604.7

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Manufacturers Association International
(ken@nrgcodeadvocates.com)

Add new text as follows:

REFLECTIVE INSULATION. Reflective insulation materials consist of one or more low-emittance surfaces, such as metallic foil or metallic deposits, unmounted or mounted on substrates. Reflective insulations derive their thermal performance from surfaces with an emittance of 0.1 or less, facing enclosed air spaces, yielding a reduction in radiant heat transfer.

Revise text as follows:

604.7 Identification. External duct insulation, except spray polyurethane foam, and factory-insulated flexible duct shall be legibly printed or identified at intervals not greater than 36 inches (914 mm) with the name of the manufacturer, the thermal resistance R-value at the specified installed thickness and the flame spread and smoke-developed indexes of the composite materials. All duct insulation product R-values shall be based on insulation only, excluding air films, vapor retarders or other duct components, and shall be based on tested C-values at 75°F (24°C) mean temperature at the installed thickness, in accordance with recognized industry procedures. The installed thickness of duct insulation used to determine its R-value shall be determined as follows:

1. For duct board, duct liner and factory-made rigid ducts not normally subjected to compression, the normal insulation thickness shall be used.
2. For duct wrap, the installed thickness shall be assumed to be 75 percent (25 percent compression) of normal thickness.
3. For factory-made flexible air ducts, the installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.
4. For spray foam polyurethane foam, the aged R-value per inch, measured in accordance with recognized industry standards, shall be provided to the customer in writing at the time of foam application.
5. For reflective insulation, R-values shall be based on tested U-values using recognized industry procedures as a reflective insulation system on rigid duct in heating, ventilation and air conditioning systems. Packages of reflective insulation shall be labeled with the number of reflective sheets, the number and thickness of the air spaces in the assembly and the R-value of the assembly.

Reason: A type of reflective insulation (reflective plastic core insulation) is currently included in the IBC Code Definitions. This proposal attempts to provide additional information relating to that product category as a whole and for the products specified in this proposal.

The proposal proposes to clarify the process within the codes for accurately labeling and evaluating the performance of reflective insulation when installed on ducts. ASTM C1668-10 addresses this issue and provides specification on how to determine product performance.

Cost Impact: The code change proposal will not increase the cost of construction.

M155-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-REFLECTIVE INSULATION-M-SAGAN.DOC

M156–12
605.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

605.1 General. Heating and air-conditioning systems ~~of the central type~~ shall be provided with *approved* air filters. Filters shall be installed <u>such that all return air, outdoor air and makeup air is filtered</u> ~~in the return air system,~~ upstream from any heat exchanger or coil. <u>Filters shall be installed</u> in an *approved* convenient location. Liquid adhesive coatings used on filters shall have a flash point not lower than 325ºF (163ºC).

Reason: It is just as important to filter outdoor air and makeup air as it is to filter return air. This provision should not be limited to central type systems because all heat exchangers need to be protected from fouling by air-borne debris.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M156-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

605.1-M-STRAUSBAUGH.PMGCAC.DOC

M157–12

[B] 607.5.4.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE WILL BE HEARD BY THE INTERNATIONAL MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

[B] 607.5.4.1 Smoke damper. <u>Smoke dampers shall close as required by Section 607.3.3.2.</u>

~~The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with the International Building Code and one of the following methods, as applicable:~~

1. ~~Where a smoke damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper . The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.~~
2. ~~Where a smoke damper is installed above smoke barrier doors in a smoke barrier , a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.~~
3. ~~Where a smoke damper is installed within an air transfer opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper .~~
4. ~~Where a smoke damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor .~~
5. ~~Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, smoke dampers shall be permitted to be controlled by the smoke detection system.~~

Reason: This text is redundant language and is not needed as Section 607.3.3.2 says exactly the same thing.

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Cost Impact: None

M157-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

607.5.4.1-M-STRAUSBAUGH.PMGCAC.DOC

M158–12
202 (New), 608 (New), 608.1 (New)

Proponent: Timothy Burgos, InterCode Incorporated, representing 3M Company

Add new text as follows:

REFLECTIVE DUCT. A duct or conduit with a reflective interior surface utilized for conveying daylight or artificial light.

SECTION 608
REFLECTIVE DUCTS

608.1 Reflective Ducts. Reflective ducts that are designed and installed to provide light to the interior space of a building shall be constructed, braced, reinforced and installed to provide structural strength and durability in accordance with the requirements of Section 603. The installation of reflective ducts shall not affect the fire protection requirements specified in the *International Building Code*. Reflective ducts shall not be used for conveying air and are not required to be pressurized.

Reason: The purpose of this code change proposal is to add a new definition and section to the International Mechanical Code in order to differentiate between duct used to convey air and duct used to convey light. There are many new technologies that exist worldwide today that bring light from the exterior of a building to the interior space of a building. These technologies utilize a reflective duct to convey the light into the building. The reflective duct is similar in construction to duct used to convey air in the way it is braced, reinforced, and installed. Reflective duct differs because it is not used to condition a space. Additionally, reflective duct does not need to meet all the requirements of an air conveying duct, i.e. the insulation and pressurization requirements.

The language used to create the new Section 608.1 was adapted from Section 603 of the 2012 International Mechanical Code. The definition for reflective duct was adapted from the definition of duct found in the 2012 International Mechanical Code.

Reflective duct (the two ducts on the outside) in an open ceiling alongside a traditional HVAC duct.

Cost Impact: The code change proposal will not increase the cost of construction.

M158-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-REFLECTIVE DUCTS-M-BURGOS.DOC

M159–12
701.2 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

701.2 Dampered openings Where combustion air openings are provided with volume, smoke or fire dampers, the dampers shall be interlocked with the firing cycle of the appliances served, so as to prevent operation of any appliance that draws combustion air from the room or space when any of the dampers are closed. Manual dampers shall not be installed in combustion air ducts. Ducts not provided with dampers and that pass through rated construction shall be enclosed in a shaft in accordance with the *International Building Code*.

Reason: This is basic pertinent information that the user shouldn't have to go to the standard to figure out.

Cost Impact: None

M159-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

702(NEW)-M-MCMANN.DOC

M160–12
802.9

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

802.9 Protection against physical damage. In concealed locations, where a vent is installed through holes or notches in studs, joists, rafters or similar members less than 11/2 inches (38 mm) from the nearest edge of the member, the vent shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage), shall cover the area of the vent where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

Reason: All vent piping needs to be protected from punctures and other forms of damage. This text is absent from this section and is consistent with the same subject matter in the family of PMG codes.

Cost Impact: None

M160-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.9-M-MCMANN.DOC

M161–12
802.10

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

802.10 Door swing. Appliance and equipment vent terminals shall be located such that doors cannot swing within 12 inches (305 mm) horizontally of the vent terminals. Door stops or closures shall not be installed to obtain this clearance.

Reason: As indicated in the photo, any appliance vent can be subject to damage as a result of a door swing even when the vent has been installed in accordance with the manufacturer's instructions. Most manufacturers do not address proximity to doors on a different plane. Even if the door doesn't come in contact with the vent terminal, the door could be left too close to the vent when the appliance is operating and possibly overheating the door causing problems.

Cost Impact: None

M161-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

802.10(NEW)-M-MCMANN.DOC

M162–12
901.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

~~901.4~~ 902.2 Fireplace accessories. Listed and labeled fireplace accessories shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Fireplace accessories shall comply with UL 907.

Reason: This section is applicable only to masonry fireplaces, therefore it belongs in Section 902 where its application will be limited to masonry fireplaces.

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Cost Impact: None

M162-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

901.4-M-STRAUSBAUGH.PMGCAC.DOC

M163–12
903.4(NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee and Thomas Stroud, Senior Manager of Codes & Standards for the Hearth, Patio & Barbecue Association, representing the Hearth, Patio & Barbecue Association.

Add new text as follows:

<u>**903.4 Gasketed fireplace doors.** A gasketed fireplace door shall not be installed on a factory-built fireplace except where the fireplace system has been specifically tested, *listed* and *labeled* for such use in accordance with UL 127.</u>

Reason:
Strausbaugh, PMG-CAC-Because of requirements in the IECC that require all fireplaces to be provided with gasketed doors, a great deal of controversy has resulted. Most factory-built fireplaces are not tested for use with sealed glass doors and installing such doors on fireplaces that are not tested for these doors could cause overheating of the fireplace resulting in a fire hazard. Without testing, the effect of the doors will be an unknown.

Stroud-Combustible clearances of the factory built fireplace and chimney system are determined by rigorous testing under UL 127. The addition of gasketed fireplace doors not specifically tested and listed for use with the fireplace can cause a change in the performance of the fireplace resulting in a hazardous condition.

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Cost Impact: None

M163-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

903.4(NEW)-M-STRAUSBAUGH.PMGCAC- STROUD.DOC

M164–12
908.5

Proponent: Guy Tomberlin, Fairfax County Virginia, representing Fairfax County Virginia (guy.tomberlin@fairfaxcounty.gov)

Revise as follows:

908.5 Water supply. Cooling towers, evaporative coolers and fluid coolers shall be provided with an approved water supply, sized for peak demand. The quality of water shall be provided in accordance with the equipment manufacturer's recommendations. ~~Water supplies~~ The piping system and protection of the potable water supply system shall be installed as required by the *International Plumbing Code.*

Reason: Various water resources are being utilized across the nation in many different ways. This is being done for many various reasons. Some are because of water shortages, others are in effort to simply conserve our precious resources and others are being done to constructively utilize rain water and properly treated re-use water. Technology provides us with the options for many different water reuses such as reclaimed and rainwater. This proposal clarifies that if the quality of water can be achieved then alternate sources shall be permitted. In addition if an interconnection or back up is provided with the potable system then proper cross connection contamination prevention shall be provided in accordance with the International Plumbing Code. Lastly, the piping system shall be installed according to the International Plumbing Code.

Cost Impact: reduces the cost below current requirements for the initial installation and throughout the life of the structure.

M164-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

908.5-M-TOMBERLIN.DOC

M165–12
908.8(NEW), Chapter 15

Proponent: Tracy Quinn, Natural Resources Defense Council, on behalf of self (tquinn@nrdc.org)

Add new text as follows:

908.8 Cooling Towers. Cooling towers greater than 150 tons in capacity shall comply with Sections 908.8.1 through 908.8.4.

908.8.1 Conductivity or Flow-based Control. Cooling towers shall include of controls that maximize the cycles of concentration based on local water quality conditions. Such controls shall automate system bleed and chemical feed based on conductivityor in proportion to metered makeup volume, metered bleed volume, or bleed time.

908.8.2 Flow Meter. A water meter or sub-meter shall be installed to measure the volume of makeup water entering the cooling tower. Where both potable and non-potable water are supplied to the tower, a meter or sub-meter shall be installed to measure each source separately.

908.8.3 Overflow Alarm. Cooling towers shall include of an overflow alarm to prevent overflow of the sump in case of makeup water valve failure. Such overflow alarm shall send an audible signal or provide an alert by means of the Building Management System to the tower operator in case of sump overflow.

908.8.4 Drift Eliminators. Cooling towers shall be equipped with drift eliminators that achieve drift reduction to 0.002 percent of the circulated water volume. Drift eliminators shall be tested using the Isokinetic Drift Measurement Test Cost for Water Cooling Tower – ATC – 140" testing code from the Cooling Technology Institute.

Add new standard to Chapter 15 as follows:

ATC-140-2011 Isokinetic Drift Measurement Test Cost for Water Cooling Tower – ATC-140" testing code.

Reason: This section includes water efficiency provisions for cooling towers and evaporative cooling systems that tend to waste large quantities of water.

The complexity of managing cooling systems combined with the high operational and financial cost of early failure of a cooling tower, can result in an overly conservative approach to tower bleed frequency. The codes as proposed here aim to ensure that all cooling towers covered by the IMC have the controls necessary to maximize cycles of concentration and minimize unintentional waters losses such as leaks and overflow. Below we have provided information specific to the revisions we have proposed. The information comes from a 2011 Codes and Standards Enhancement Initiative (CASE) for Cooling Tower Water Savings prepared by the California Statewide Utility Code and Standards Program on Cooling Tower Water Savings (attached), hereafter referred to as the CASE study.

Flow meter – "This measure provides a number of water-efficiency benefits. A flow meter on the makeup water line effectively submeters the cooling tower, allowing the operator to know how much water the tower is using and facilitating the identification of excessive water use due to leaks, for example."

Alarm – "Unintended water losses can occur if the standard float valve that controls the flow of makeup water in the sump fails, resulting in overflow into the sewer line. The failure of the makeup water line control also results in uncontrolled dilution and no activation of chemical feed, putting the system at risk for scale. An overflow alarm prevents these losses from going undetected for days, weeks or longer. An overflow alarm system includes a float switch and an audible electronic signaling device or notification through a building management system. Industry contacts, including cooling tower manufacturers and water treatment companies, generally indicated that the prevalence of installed overflow alarms is very low."

Drift Eliminators – "Efficient drift eliminators minimize losses due to drift, which is liquid water that is blown or splashed out of the tower during normal operations. Drift eliminators include secondary benefits, such as minimizing the spread of disease and preventing damage to adjacent property, such as parked cars, that would otherwise be splashed. According to representatives of cooling tower manufacturers, water treatment companies and drift eliminator distributors, most cooling towers have drift eliminators installed and the drift eliminators are likely to control drift losses to 0.005% or less. Current practice for new tower installations is to include drift eliminators and at least one manufacturer, Evapco, specifies equipment that limits losses to a maximum of 0.0001%." The Cooling Technology Institute (CTI) has a test code for measuring drift that should be used to meet this requirement; "Isokinetic Drift Measurement Test Cost for Water Cooling Tower – ATC – 140". The purpose of this code is to describe instrumentation and procedures for the testing and evaluation of drift from water-cooling towers. The code was revised in July 2011.

According to the CASE study, application of these code changes should result in a first year statewide water savings 32.3 million gallons in California (based on statewide annual sales of water-cooled chillers). Using the statewide average embedded energy value of 9.977 kWh/million gallons of water, the first year statewide energy savings is 323 MWh. Extracting this to an estimated national savings (based on population ratios), this code change could save 268 million gallons of water in the first year, and 2678 MWh.

Cost Impact: A cost-effectiveness analysis was performed as part of a Codes and Standards Enhancement Initiative (CASE) for Cooling Tower Water Savings, prepared by the California Statewide Utility Codes and Standards Program (attached).

From CASE: “Below are the present value costs and savings associated with the proposed measures installed on a 350 ton cooling tower over the 15 year analysis period.”

Table 11. Life Cycle Cost of Proposed Measures

Measure Name	Additional Costs- Current Measure Costs (Relative to Basecase) ($)		PV of Additional Maintenance Costs (Savings) (Relative to Basecase) (PV$)		PV of Water and Chemical Cost Savings - Per Proto Building (PV$)	LCC Per Prototype Building ($)	
	Per unit	Per Proto Building	Per unit	Per Proto Building		Based on Current Costs	Based on Post-Adoption Costs
Cooling Tower Measures	$3,624	$3,624	$0	$0	$11,165	-$7,540	-$7,540

Analysis: A review of the standard proposed for inclusion in the code, [ATC-140-2011] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M165-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

908.5.1-M-QUINN.DOC

M166–12
917.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Delete text as follows:

~~**917.2 Prohibited location.** Cooking appliances designed, tested, *listed* and *labeled* for use in commercial occupancies shall not be installed within *dwelling units* or within any area where domestic cooking operations occur.~~

Reason: Section 917.2 is redundant with Section 917.3 and there may be appliances that are listed for both domestic and commercial use and such appliances would be prohibited by current text. Current Section 917.3 captures the entire intent and is all that is needed.

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Cost Impact: None

M166-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

917.2-M-STRAUSBAUGH.PMGCAC.DOC

M167–12
918.6(NEW), 918.8, 601.5 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Delete and substitute text as follows:

~~**918.6 Prohibited sources.** Outdoor or return air for forced air heating and cooling systems shall not be taken from the following locations:~~

1. ~~Less than 10 feet (3048 mm) from an *appliance* vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outdoor air inlet.~~
2. ~~Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.~~
3. ~~A hazardous or insanitary location or a refrigeration *machinery room* as defined in this code.~~
4. ~~A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Sections 918.2 and 918.3, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.~~

   ~~**Exception:** The minimum volume requirement shall not apply where the amount of return air taken from~~
   ~~a room or space is less than or equal to the amount of supply air delivered to such room or space.~~

5. ~~A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.~~

   ~~**Exceptions:**~~

   ~~5.1 Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances, and serve the kitchen area only, taking return air from a kitchen shall not be prohibited.~~
   ~~5.2 Dedicated forced-air systems serving only a garage shall not be prohibited from obtaining return air from the garage.~~
6. ~~An unconditioned crawl space by means of direct connection to the return side of a forced air system. Transfer openings in the crawl space enclosure shall not be prohibited.~~
   ~~7. A room or space containing a fuel-burning *appliance* where such room or space serves as the sole source of return air.~~

   ~~**Exceptions:**~~

   ~~7.1. This shall not apply where the fuel-burning *appliance* is a direct-vent *appliance*.~~
   ~~7.2. This shall not apply where the room or space complies with the following requirements:~~
   ~~7.2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuelburning appliances therein.~~
   ~~7.2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.~~
   ~~7.2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of any *appliance* firebox or draft hood in the same room or space.~~

~~7.3. This shall not apply to rooms or spaces containing solid-fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of the appliances.~~

~~**918.8 Return-air limitation.** Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.~~

918.6 Outdoor and Return air openings. Outdoor intake openings shall be located in accordance with Section 401.4. Return air openings shall be located in accordance with Section 601.5.

601.5. Return air openings. Return air openings for heating, ventilation and air conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet measured in any direction from an open combustion chamber or draft hood of another appliance located in the same room or space.
2. Return air shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the appliance or equipment manufacturers' installation instructions, ACCA Manual D or the design of the *registered design professional*.
5. Return air from one dwelling unit shall not be discharged into or taken from another dwelling unit.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet from the cooking appliances.
2. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage

Reason: This is an attempt to reorganize and delete language in this section that contains outdated legacy code language. This Section is much more complicated than it needs to be as the foremost concern regarding return air is to keep contaminants out of the openings and air stream. This section is long over-due for an overhaul the intent in which is to simplify the matter.

- This section is being relocated to more central location as the subject matter applies to more than just furnaces; it applies to air conditioning and ventilation systems as well. A simple reference to this new Section is all that will be required in the new 918.6. Outdoor air intake openings are already covered in 401.4 and do not need to be duplicated here.

- Existing item 1 and 2 dealt primarily with outdoor opening which can be referenced in 401.4.

    - Existing item 3 remains in its new location.

    - Existing item 4 will literally prevent a return air opening in most bedrooms as they are usually less than 25% of the area served. There is no technical justification for this benchmark. What significance would there be between 25% and 26% that will impact the return air system? There is no need for such an arbitrary benchmark. What's really important is not to take too much air out of a room as noted in the new #3.

    - The size of any transfer should be according to design, not arbitrary, outdated numbers as in the existing #4

    - Existing 5 and 6 remain in the new location.

    - Item 7 has many problems and has been deleted in its entirety. It's a tortured approach as it attempts to describe a furnace in an enclosure with no return air duct along side a water heater all the while using the enclosure as a plenum utilizing louvered doors or openings to bring air back to the unit. This is not current practice and is prohibited. It calls for volume which is twice as much as current combustion requirements and is very difficult to explain the picture it attempts to deliver.

- Section 918.8 has been incorporated into the new location as #7.

All the usual requirements that can affect the quality and installation of return air openings are contained in this new location and in turn, simplifies the subject matter for the user. There are no new requirements.

Cost Impact: None

M167-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

918.6-M-MCMANN.DOC

M168–12
928.1

Proponent: Guy Tomberlin, Fairfax County VA, representing Fairfax County Virginia (guy.tomberlin@fairfaxcounty.gov)

Revise as follows:

928.1 General. Evaporative coolers equipment shall:

1. Be installed in accordance with the manufactures instructions.
2. Be installed on a level platform in accordance with section 304.10.
3. Have openings in exterior walls or roofs flashed in accordance with the *International Building Code.*
4. ~~Be provided with potable water backflow protection in accordance with section 608 of the *International Plumbing Code*.~~Be provided with an approved water supply, sized for peak demand. The quality of water shall be provided in accordance with the equipment manufacturer's recommendations. The piping system and protection of the potable water supply system shall be installed as required by the *International Plumbing Code*.
5. Have air intake opening locations in accordance with Section 401.4.

Reason: This is consistent action in accordance with the proposal submitted to Section 908 for cooling towers. Various water resources are being utilized across the nation in many different ways. This is being done for many various reasons. Some are because of water shortages, others are in effort to simply conserve our precious resources and others are being done to constructively utilize rain water and properly treated re-use water. Technology provides us with the options for many different water reuses such as reclaimed and rainwater. This proposal clarifies that if the quality of water can be achieved then alternate sources shall be permitted. In addition if an interconnection or back up is provided with the potable system then proper cross connection contamination prevention shall be provided in accordance with the International Plumbing Code. Lastly, the piping system shall be installed according to the International Plumbing Code.

Cost Impact: reduces the cost below current requirements for the initial installation and throughout the life of the structure.

M168-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

928.1-M-TOMBERLIN.DOC

M169–12
923.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE IMC COMMITTEE AS 2 SEPARATE CODE CHANGES, SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I-IMC

Revise as follows:

SECTION 923
~~SMALL~~ CERAMIC KILNS

923.1 General. ~~The provisions of this section shall apply to kilns that are used for ceramics, have a maximum interior volume of 20 cubic feet (0.566 m^3) and are used for hobby and noncommercial purposes~~. Kilns shall be listed and labeled unless otherwise approved in accordance with Section 105.2. Electric kilns shall comply with UL 499. The approval of unlisted appliances in accordance with Section 105.2 shall be based upon approved engineering evaluation.

Reason: The code is silent on kilns over 20 cubic feet in volume. For example, if someone wanted to construct a very large gas-fired kiln, the code would provide no guidance and such appliance would likely be unlisted. A similar change is proposed for the IFGC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

PART II-IFGC

SECTION 629
~~SMALL~~ CERAMIC KILNS

629.1 General. ~~Ceramic~~ Kilns ~~with a maximum interior volume of 20 cubic feet and used for hobby and noncommercial purposes~~ shall be installed in accordance with the manufacturer's ~~installation~~ instructions and the provisions of this code. Kilns shall comply with Section 301.3

Reason: The code is silent on kilns over 20 cubic feet in volume. For example, if someone wanted to construct a very large gas-fired kiln, the code would provide no guidance and such appliance would likely be unlisted. A similar change is proposed for the IMC.

Cost Impact: None

M169-12
PART I-IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II-IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

923.1-M-STRAUSBAUGH.PMGCAC.DOC

M170–12
1001.1

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

SECTION 1001
GENERAL

1001.1 Scope. This chapter shall govern the installation, alteration and repair of boilers, water heaters and pressure vessels.

Exceptions:

1. Pressure vessels used for unheated water supply.
2. Portable unfired pressure vessels and Interstate Commerce Commission containers.
3. Containers for bulk oxygen and medical gas.
4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within occupancies of Groups B, F, H, M, R, S and U.
5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.
6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems.
7. ~~Any boiler or pressure vessel subject to inspection by federal or state inspectors.~~

Reason: This is not a code requirement. It's a given that Federal and State requirements can trump local codes and this would occur for more than just boilers. If this is absent from the code nothing changes. Why is this language only in Chapter 10? It should be in Chapter 1 if anywhere as this is administrative in nature. This would need to be in each chapter to be effective which doesn't make much sense.

Cost Impact: None

M170-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1001.1-M-MCMANN.DOC

M171–12
1003.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1003.1 General. All pressure vessels, unless otherwise *approved* shall be constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Codes,* ~~*shall bear the label of an approved agency*~~ and shall be installed in accordance with the manufacturer's instructions and nationally recognized standards. Directly fired pressure vessels shall meet the requirements of Section 1004.

Reason: This proposal provides language as contained in the ASME Boiler and Pressure Vessel Codes and gives the authority having jurisdiction the ability to approve other constructions while still adopting the IMC.

Cost Impact: The code change proposal will not increase the cost of construction.

M171-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.1-M-SCRIBNER.DOC

M172– 12
1003.3, Chapter 15

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1003.3 Welding. Welding on pressure vessels shall be performed by ~~*approved* welders in compliance with nationally recognized standards.~~ an R-Stamp holder in accordance with the *National Board Inspection Code, Part 3* or in accordance with an *approved* standard.

Add new standard to Chapter 15 as follows:

National Board Inspection Code 2011, Part 3

Reason: The National Board R- Stamp program is the only nationally recognized standard for weld repairs and/or alterations to boilers and pressure vessels. The standard is also required by the U.S. Department of Transportation. Some state and local jurisdictions do have modified versions of the R stamp program that they utilize; the proposed wording covers both possibilities while clearly stating the nationally recognized standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [National Board Inspection Code 2011, Part 3] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M172-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1003.3-M-SCRIBNER.DOC

M173–12
1004.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1004.1 Standards. ~~Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code*, Section I or IV; NFPA 8501; NFPA 8502 or NFPA 8504.~~ Boilers shall be designed, constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Code*, Section I or IV. Controls and safety devices for boilers with fuel input ratings of 12,500,000 Btu/hr or less shall meet the requirements of ASME *CSD-1.* Controls and Safety devices for boilers with inputs greater than 12,500,000 shall meet the requirements of *NFPA 85.* Package oil fired boilers shall be listed and labeled in accordance with *UL 726* or other *approved* standard. Packaged electric boilers shall be listed and labeled in accordance with *UL 834* or other *approved* standard.

Reason: Current wording is not correct since ASME CSD-1 is not a construction standard. The proposed wording starts with the vessel construction requirements and continues with the acceptable standards for complete appliances. The proposed wording is no change from the intent of the previous wording. NFPA 8501, 8502 & 8504 have been combined into NFPA 85.

Cost Impact: The code change proposal will not increase the cost of construction.

M173-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1004.1-M-SCRIBNER.doc

M174–12
1006.8

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1006.8 Electrical requirements. The power supply to the electrical control system shall be from a two-wire branch circuit that has a grounded conductor, or from an isolation transformer with a two-wire secondary. Where an isolation transformer is provided, one conductor of the secondary winding shall be grounded. Control voltage shall not exceed 150 volts nominal, line to line. Control and limit devices shall interrupt the ungrounded side of the circuit. A means to manually disconnecting the control circuit shall be provided, and controls shall be arranged so that when deenergized, the burner shall be inoperative. Such means shall be capable of being locked in the off position and shall be provided with ready access. A manually operated remote shutdown switch or circuit breaker shall be installed at an *approved* location.

Reason: The proposed wording clarifies an important electrical requirement that is already in codes that are referenced by the IMC. (ASME CSD-1).

Cost Impact: The code change proposal will not increase the cost of construction.

M174-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1006.8-M-SCRIBNER.DOC

M175–12
1007.1, 1007.2, 1007.3

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

1007.1 General. ~~All~~ Steam and hot water boilers shall be protected with a low-water cutoff control except as required by Section 1007.2.

1007.2 Flow sensing control. Coil-type and water-tube-type boilers that require forced circulation of water through the boiler shall be protected with a flow sensing control.

1007.~~2~~ 3 Operation. ~~The~~ Low-water cutoff controls and flow sensing controls required by Sections 1007.1 and 1007.2 shall automatically stop the combustion operation of the appliance when the water level drops below the lowest safe water level as established by the manufacturer or when water circulation stops, respectively.

Reason: There is no exception to Section 1007.1 for coil-type hot water supply boilers that require forced circulation and use flow switches to stop combustion when water flow is lost. Flow switches that monitor forced circulation through a water tube- or coil-type boiler provide the same function as a low-water cutoff and should be recognized as an alternative to a low-water cutoff.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M175-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1007.1-M-STRAUSBAUGH.PMGCAC.DOC

M176–12
1008, 1008.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

SECTION 1008
~~STEAM~~ BOTTOM BLOWOFF VALVE

Revise as follows:

1008.1 General. Every steam boiler shall be equipped with ~~a quick-opening blowoff valve.~~ bottom blowoff valve(s). The valve(s) shall be installed in the opening provided on the boiler. The minimum size of the valve(s) and associated piping shall be the size specified by the boiler manufacturer or the size of the boiler blowoff-valve opening. Where the maximum allowable working pressure of the boiler exceeds 100 psig, two bottom blowoff valves shall be provided consisting of either two slow opening valves in series or one quick opening valve and one slow opening in series with the quick opening valve installed closest to the boiler.

Reason: The proposed wording clarifies the type of valve. The term steam blowoff valve is confused with a safety or safety relieve valve. The proposed wording is consistent with *ASME Boiler & Pressure Vessel Codes* and the *National Board Inspection Code*. The proposed wording is consistent with *ASME Boiler & Pressure Vessel Codes* and *ASME Code for Pressure Piping.* (B31.1).

Cost Impact: This proposed change could have a cost impact of $200 to $2000 depending on the size of the boiler. The cost would include the cost of the valve and labor to install it. Boiler systems that are designed in accordance with the ASME Boiler & Pressure Vessel codes would not be impacted since they already meet this requirement.

M176-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1008-1008.1-M-SCRIBNER.DOC

M177–12
1009.2

Proponent: Gary L. Scribner, State of Missouri/Missouri Division of Fire Safety, the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1009.2 Closed-type expansion tanks. Closed-type expansion tanks shall be installed in accordance with the manufacturer's instructions. Expansion tanks for systems designed to have an operating pressure in excess of 30 psi shall be constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Codes.* The size of the tank shall be based on the capacity of the hot-water-heating system. The minimum size of the tank shall be determined in accordance with the following equation where all necessary information is known:

(Portions of text not shown remain unchanged.)

The minimum size of the tank shall be determined from Table 1009.2 where all necessary information is not known:

TABLE 1009.2
CLOSED-TYPE EXPANSION TANK SIZING

System Volume In gallons	Tank Capacities in gallons	
	Pressurized Diaphragm Type	Non-Pressurized Type
100	9	15
200	17	30
300	25	45
400	33	60
500	42	75
1,000	83	150
2,000	165	300

Reason: The proposed wording is consistent with *ASME Boiler & Pressure Vessel Codes* Section IV, Paragraph HG-709.2 & Table 709.2.

Cost Impact: The code change proposal will not increase the cost of construction.

M177-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1009.2-M-SCRIBNER.DOC

M178–12
1011.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1011.1 Tests. Upon completion of the assembly and installation of boilers and pressure vessels, acceptance tests shall be conducted in accordance with the requirements of the ASME *Boiler and Pressure Vessel Code* or the manufacturer's requirements and such tests shall be *approved*. ~~Where field assembly of pressure vessels or boilers is required, a copy of the completed U-1 Manufacturer's Data Report required by the *ASME Boiler & Pressure Vessel Code* shall be submitted to the code official.~~ A copy of all test documents along with all manufacturer's data reports required by the ASME *Boiler and Pressure Vessel Codes* shall be submitted to the code official.

Reason: Current wording requires a form U1-a which is an ASME manufacturer's data report for a pressure vessel only. There are several manufacturer's data reports depending on the type of vessel and the section of the code the vessel was built to. The proposed meets the current intent of the code without detailing each form required for each type of vessel.

Cost Impact: The code change proposal will not increase the cost of construction.

M178-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1011.1-M-SCRIBNER.DOC

M179–12
1101.10

Proponent: David R. Scott, AIA, representing Target Corporation. (David.Scott@Target.com)

Revise as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

> <u>**Exception:** This section shall not apply to refrigerant circuit access ports on equipment installed in controlled areas such as on roof tops with locked and alarmed access hatches or doors.</u>

Reason: Building roofs that secure equipment by means of locked and alarmed devices prevent unauthorized access to such areas.

Cost Impact: The code change proposal will not increase the cost of construction.

M179-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1101.10-M-SCOTT.DOC

M180-12
1101.10

Proponent: Claude Kennedy, Oregon Mechanical Officials Association
(ckennedy@cityofsalem.net)

Revise as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

> **Exception:** Refrigerant circuit access ports on roof top units not accessible to the public.

Reason: The purpose of this section is to prevent the inappropriate usage of refrigerant by the public by making access to the refrigerant access ports difficult if not impossible. We feel that placing units in these locations makes access to the ports difficult if not impossible.

Cost Impact: Savings due to not requiring installation of locking caps in unnecessary locations.

M180-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.1-M-KENNEDY.DOC

M181–12
1102.3 (NEW)

Proponent: Mona Casey, Founder, United Parents to Restrict Open Access to Refrigerant

Add new text as follows:

1102.3 Access port protection. Refrigerant access ports shall be protected in accordance with Section 1101.10 whenever refrigerant is added to or recovered from refrigeration or air conditioning systems.

Reason: The purpose of the code change proposal is to add requirements to the code for securing refrigerant access ports whenever intrusive access to the refrigeration or air conditioning units are necessary for adding or recovering refrigerant. This change compliments the current requirements in the code.

Cost Impact: The code change proposal will increase the cost of construction.

M181-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1102.3(NEW)-M-CASEY.DOC

M182–12
202, Table 1103.1, 1104.1

Proponent: Steve Ferguson, representing the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE**)**

Revise as follows:

SECTION 202
GENERAL DEFINITIONS

FLAMMABILITY CLASSIFICATION. Refrigerants shall be assigned to one of the three classes—1, 2 or 3— and one optional subclass (2L), in accordance with ASHRAE 34. For Classes 2, 2L, and 3, the heat of *combustion* shall be calculated assuming that *combustion* products are in the gas phase and in their most stable state.

> **Class 1.** Refrigerants that do not show flame propagation when tested in air at 14.7 psia (101 kPa) and ~~70~~ 140ºF (~~21~~ 60ºC).
>
> **Class 2.** Refrigerants having a lower flammability limit (LFL) of more than 0.00625 pound per cubic foot (0.10 kg/m$_3$) at ~~70~~ 140ºF (~~21~~ 60ºC) and 14.7 psia (101 kPa) and a heat of *combustion* of less than ~~8,174~~ 8169 Btu/lb (19 000 kJ/kg).
>
> > **Subclass 2L (Optional),** Refrigerants that meet the additional condition of having a maximum burning velocity of less than or equal to 3.9 in/s (10 cm/s) when tested at 73.4 ºF (23ºC) and 14.7 psia (101.3 kPa).
>
> **Class 3.** Refrigerants that are highly flammable, having a LFL of less than or equal to 0.00625 pound per cubic foot (0.10 kg/m$_3$) at ~~70~~ 140ºF (~~21~~ 60ºC) and 14.7 psia (101 kPa) or a heat of *combustion* greater than or equal to ~~8,174~~ 8169 Btu/lb (19 000 kJ/kg).

OCCUPATIONAL EXPOSURE LIMIT (OEL). The time-weighted average (TWA) concentration for a normal eight-hour workday and a 40-hour workweek to which nearly all workers can be repeatedly exposed without adverse effect, based on the OSHA PEL, ACGIH TLV-TWA, AIHA WEEL, or consistent value.

REFRIGERANT SAFETY CLASSIFICATIONS. Groupings that indicate the toxicity and flammability classes in accordance with Section 1103.1. The classification group is made up of a letter (A or B) that indicates the toxicity class, followed by ~~a number~~ one or two alphanumeric characters (1, 2, 2L or 3) that indicates the flammability class. Refrigerant blends are similarly classified, based on the compositions at their worst cases of fractionation, as separately determined for toxicity and flammability. In some cases, the worst case of fractionation is the original formulation.

> **Flammability.** See "FLAMMABILITY CLASSIFICATION" ~~Class 1 indicates refrigerants that do not show flame propagation in air when tested by prescribed methods at specified conditions. Classes 2 and 3 signify refrigerants with "lower flammability" and "higher flammability," respectively; the distinction depends on both the LFL and heat of *combustion*.~~
>
> **Toxicity.** See "TOXICITY CLASSIFICATION". ~~Classes A and B signify refrigerants with "lower toxicity" and "higher toxicity," respectively, based on prescribed measures of chronic (long-term, repeated exposures) toxicity.~~

TOXICITY CLASSIFICATION. Refrigerants shall be classified for toxicity to one of two classes in accordance with ASHRAE 34:

> **Class A.** Refrigerants ~~for which toxicity has not been identified at concentrations~~ that have an occupational exposure limit (OEL) of ~~less than or equal to~~ 400 parts per million (ppm) or greater.~~, based on data used to determine Threshold Limit Value-Time-Weighted Average (TLVTWA) or consistent indices.~~
>
> **Class B.** Refrigerants ~~for which there is evidence of toxicity at concentrations below~~ that have an OEL of less than 400 ppm.~~, based on data used to determine TLV-TWA or consistent indices.~~

[F] TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-11[d]	CCl_3F	trichlorofluoromethane	A1	2-0-0[b]	0.39	1,100	6.2	C1,000
R-12[d]	CCl_2F_2	dichlorodifluoromethane	A1	2-0-0[b]	5.6	18,000	90	1,000
R-13[d]	$CClF_3$	chlorotrifluoromethane	A1	2-0-0[b]	—	—	—	1,000
R-13B1[d]	$CBrF_3$	bromotrifluoromethane	A1	2-0-0[b]	—	—	—	1,000
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	2-0-0[b]	25	110,000	400	1,000
R-22	$CHClF_2$	chlorodifluoromethane	A1	2-0-0[b]	13	59,000	210	1,000
R-23	CHF_3	trifluoromethane (fluoroform)	A1	2-0-0[b]	7.3	41,000	120	1,000
R-32	CH_2F_2	Difluoromethane (methylene fluoride)	A2L	—	4.8	36,000	77	1,000
R-113[d]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	2-0-0[b]	1.2	2,600	20	1,000
R-114[d]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	2-0-0[b]	8.7	20,000	140	1,000
R-115	$CClF_2CF_3$	chloropentafluoroethane	A1	—	47	120,000	760	1,000
R-116	CF_3CF_3	hexafluoroethane	A1	1-0-0	34	97,000	550	1,000
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	2-0-0[b]	3.5	9,100	57	50
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	2-0-0[b]	3.5	10,000	56	1,000
R-125	CHF_2CF_3	pentafluoroethane	A1	2-0-0[b]	23	75,000	370	1,000
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	2-0-0[b]	13	50,000	210	1,000
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	—	0.78	2,600	12	500
R-142b	CH_3CClF_2	1-chloro-1,1-difluoroethane	A2	—	5.1	20,000	83	1,000
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2L	2-0-0[b]	4.5	21,000	70	1,000
R-152a	CH_3CHF_2	1,1-difluorethane	A2	1-4-0	2.0	12,000	32	1,000
R-170	CH_3CH_3	ethane	A3	2-4-0	0.54	7,000	8.7	1,000
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	—	1.0	8,500	16	1,000
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	2-0-0[b]	43	90,000	690	1,000
R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	—	36	84,000	580	1,000
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	2-0-0[b]	21	55,000	340	1,000
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	2-0-0[b]	12	34,000	190	300
R-290	$CH_3CH_2CH_3$	propane	A3	2-4-0	0.56	5,300	9.5	1,000
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	—	41	80,000	660	1,000

(continued)

[F] TABLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m³	OEL[e]
R-400[d]	zeotrope	R-12/114 (50.0/50.0)	A1	2-0-0[b]	10	28,000	160	1,000
R-400[d]	zeotrope	R-12/114 (60.0/40.0)	A1		11	30,000	170	1,000
R-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	2-0-0[b]	6.6	27,000	110	1,000
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	2-0-0[b]	7.2	30,000	120	1,000
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	2-0-0[b]	5.2	20,000	84	1,000
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	2-0-0[b]	~~8.5~~ 17	66,000 ~~33,000~~	270 ~~140~~	1,000
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	2-0-0[b]	15	63,000	240	1,000
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	2-0-0[b]	7.6	33,000	120	1,000
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	2-0-0[b]	18	70,000	290	1,000
R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	2-0-0[b]	31	130,000	500	1,000
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/2.5)	—	—	16	57,000	260	1,000
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	—	4.7	21,000	25	1,000
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	2-0-0[b]	~~18~~ 19	~~78,000~~ 83,000	~~290~~ 300	1,000
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	2-0-0[b]	~~20~~ 21	~~77,000~~ 79,000	~~320~~ 330	1,000
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	2-0-0[b]	~~17~~ 18	~~76,000~~ 81,000	~~270~~ 290	1,000
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	2-0-0[b]	~~15~~ 16	~~65,000~~ 68,000	~~240~~ 250	1,000
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	2-0-0[b]	~~16~~ 17	~~75,000~~ 80,000	~~260~~ 280	1,000
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	-	20	95,000	320	1,000
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	2-0-0[b]	21	95,000	340	1,000
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	2-0-0[b]	7.1	29,000	110	1,000
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	2-0-0[b]	7.3	30,000	120	1,000
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	2-0-0[b]	~~25~~ 26	~~130,000~~ 140,000	~~390~~ 420	1,000
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	2-0-0[b]	~~24~~ 27	~~130,000~~ 140,000	~~390~~ 430	1,000
R-411A	zeotrope	R-1270/22/152a (1.5/87.5/11.0)	A2	—	2.9	14,000	46	990
R-411B	zeotrope	R-1270/22/152a	A2	—	2.8	13,000	45	980

		(3.0/94.0/3.0)						
R-412A	zeotrope	R-22/~~3~~218/142b (70.0/5.0/25.0)	A2	—	5.1	22,000	82	1,000
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	—	5.8	22,000	94	1,000
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	—	6.4	26,000	100	1,000
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	—	6.0	23,000	95	1,000

(continued)

[F] TABLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	—	2.9 ~~12~~	~~57,000~~ 14,000	47 ~~190~~	1,000
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	—	2.1 ~~9.3~~	~~52,000~~ 12,000	34 ~~120~~	1,000
R-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	2-0-0[b]	3.9	14,000	62	1,000
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	2-0-0[b]	3.5	13,000	56	1,000
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	-	4.3	15,000	70	1,000
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	—	4.8 ~~13~~	~~59,000~~ 22,000	77 ~~200~~	1,000
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	—	4.2 ~~19~~	~~70,000~~ 15,000	67 ~~310~~	1,000
R-420A	zeotrope	R-134a/142b (88.0/~~0~~ 12.0)	A1	2-0-0[b]	12	45,000	190	1,000
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	2-0-0[b]	17	61,000	280	1,000
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	2-0-0[b]	21	69,000	330	1,000
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	2-0-0[b]	18	63,000	290	1,000
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	2-0-0[b]	16	~~26,000~~ 56,000	250	1,000
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	2-0-0[b]	18	62,000	290	1,000
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	2-0-0[b]	16	58,000	260	1,000
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	2-0-0[c]	19	59,000	310	1,000
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	2-0-0[b]	6.2	23,000	100	970
R-425A	~~zoetrope~~ zeotrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	2-0-0[b]	16	~~67,000~~ 72,000	~~250~~ 260	1,000
R-426A	zeotrope	R-125/134a/600~~a~~/601a (5.1/93.0/1.3/0.6)	A1	—	5.2	20,000	83	990
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	—	18	~~76,000~~ 79,000	~~280~~ 290	1,000

R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	—	23	83,000	370	1,000
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	—	0.81	6,300	13	1,000
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	—	1.3	8,000	21	1,000
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	—	0.69	5,500	11	1,000
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	—	0.13	1,200	2.1	~~710~~ 700
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	—	0.34	3,100	5.5	880
R-433B	zeotrope	R-1270/290 (5.0/95.0)	A3	—	0.51	4,500	8.1	950
R-433C	zeotrope	R-1270/290 (25.0/75.0)	A3	—	0.41	3,600	6.6	790
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	—	20	73,000	320	1,000
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	—	1.1	8,500	17	1,000
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	—	0.50	4,000	8.1	1,000
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	—	0.51	4,000	8.1	1,000
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	—	5.0	19,000	~~81~~ 82	990
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	-	4.9	~~19,000~~ 20,000	79	990
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	-	4.7	26,000	76	990
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	-	1.9	12,000	31	1,000
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	-	0.39	3,200	6.3	1,000
R-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	-	21	100,000	330	1,000

(continued)

BLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-500[e]	azeotrope	R-12/152a (73.8/26.2)	A1	2-0-0[b]	7.6	30,000	120	1,000
R-501[d]	azeotrope	R-22/12 (75.0/25.0)	A1	—	13	54,000	210	1,000
R-502[e]	azeotrope	R-22/115 (48.8/51.2)	A1	2-0-0[b]	21	73,000	330	1,000
R-503[e]	azeotrope	R-23/13 (40.1/59.9)	—	2-0-0[b]	—	—	—	1,000
R-504[d]	azeotrope	R-32/115 (48.2/51.8)	—	—	~~29~~ 28	140,000	~~460~~ 450	1,000
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	2-0-0[b]	32	130,000	520	1,000
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	2-0-0[b]	14	55,000	220	1,000
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	2-0-0[b]	13	52,000	200	1,000
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	2-0-0[b]	24	75,000	390	1,000
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	—	0.87	7,300	14	1,000
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	-	0.59	5,300	9.5	1,000
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	-	1.9	11,000	31	1,000
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	1-4-0	0.15	1,000	2.4	1,000
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	2-4-0	0.59 ~~0.6~~	4,000	9.6	1,000
R-601	$CH_3CH_2CH_2\ CH_2\ CH_3$	pentane	A3	—	0.18 ~~0.2~~	1,000	2.9	600
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	—	0.18 ~~0.2~~	1,000	2.9	600
R-717	NH_3	ammonia	B2L	3-3-0[c]	0.014	320	0.22	25
R-718	H_2O	water	A1	0-0-0	—	—	—	—
R-744	CO_2	carbon dioxide	A1	2-0-0[b]	4.5	40,000	72	5,000
R-1150	$CH_2=CH_2$	ethene (ethylene)	A3	1-4-2	—	—	—	200
R-1234yf	$CF_3CF=CH_2$	2,3,3,3-tetrafluoro-1 propene	A2L	—	4.7	16,000	75	500
R-1234ze(E)	$CF_3CH=CHF$	trans-1,3,3,3-tetrafluoro-1-propene	A2L	-	4.7	16,000	75	800
R-1270	$CH_3CH=CH_2$	~~P~~propene (propylene)	A3	1-4-1	0.11	1,000	1.7	500

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m^3.

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.
b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.
c. For installations that are entirely outdoors, use 3-1-0.
d. Class I ozone depleting substance; prohibited for new installations.
e. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the AIHA WEEL or consistent value on a time-weighted average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.

SECTION 1104
SYSTEM APPLICATION REQUIREMENTS

1104.1 General. The refrigerant, *occupancy* and system classification cited in this section shall be determined in accordance with Sections 1103.1, 1103.2 and 1103.3, respectively. ~~For refrigerant blends assigned dual classifications, as formulated and for the worst case of fractionation, the classifications for the worst case of fractionation shall be used.~~

Reason: ASHRAE recently added a new flammability classification, "2L", to ANSI/ASHRAE Standard 34, Designation and Safety Classification of Refrigerants. Refrigerants classified as 2L meet the requirements for class 2 refrigerants and have a burning velocity of less than 3.9 in/s (10 cm/s). These refrigerants, while flammable, are difficult to ignite and have unstable flames that are easy to extinguish. The new classification was established to differentiate these refrigerants from other Class 2 refrigerants that burn more rapidly and present a larger risk if ignited. This change was precipitated by the need for refrigerants with a lower global warming potential, some of which are mildly flammable. A separate code change proposal is being submitted by ASHRAE based on changes to Standard 15, Safety Standard for Refrigeration Systems, that will provide the requirements for the use of class 2L refrigerants. The changes resulting from the additional of the new safety classification are included below along with other changes to update the IMC with new refrigerants and to correct some of the data in Table 1103.1.

Section 202, GENERAL DEFINITIONS

The definition of FLAMMABILITY CLASSIFICATION is being updated to include the 2L classification. This is being added as an optional subclass of Class 2 so that only those manufacturers that want their refrigerant classified as 2L will have to measure the burning velocity. The test temperature for determining flame propagation and for measuring the LFL of a refrigerant has been increased to be consistent to be consistent with common practice today and with the requirements of ANSI/ASHRAE Standard 34. The higher test temperature is a more conservative measure of the LFL.

The DEFINITION OF TOXICITY CLASSIFICATION is being modified to make it easier to understand. This is an editorial change and does not result in a change to the toxicity classification of any refrigerants in table 1103.1

A definition of OCCUPATIONAL EXPOSURE LIMITS (OEL) is being added because it used to determine the toxicity classification of a refrigerant. This is a generic term, and allows the use of OELs from various organizations that evaluate the toxicity of refrigerants and publish exposure limits, e.g. Workplace Environmental Exposure Limit (WEEL) from the American Industrial Hygiene Association (AHIA), Threshold Limit Values – Time Weighted Average (TLV-TWA) from the American Conference of Governmental Industrial Hygienists (ACGIH), Permissible Exposure Limits (PEL) from the National Institute for Occupational Safety and Health (NIOSH).

The definition for REFRIGERANT SAFETY CLASSIFICATIONS is being updated to include the new 2L flammability safety classification. The portions of this definition related to flammability classification and toxicity classification refer the reader to the other definitions rather than repeating the information as part of this definition as is done in the 2012 IMC.

Table 1103.1 REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

Several new refrigerants have been developed to replace ozone depleting substances and/or to replace refrigerants with a high global warming potential. Nine refrigerants have been added to ANSI/ASHRAE Standard 34 since publication of the 2012 IMC. These refrigerants are: R-407F, R-417B, R-439A, R-440A, R-441A, R-442A, R-511A, R-512A, and R-1234ze(E)

Corrections were made to the amount of refrigerant per occupied space for R-152a, R-E170, R-402A, R-415A, R-415B, R-417B, R-418A, R-419A, R-422B, R-436A, R-436B, R-437A, R-511A, R-512A, R-600, R-600a, R-601, R-601a, and R-1270. These changes are being made to correct errors in the 2012 IMC.

The cardiac sensitization NOEL for R-32 has been changed from 200,000 ppm to 350,000 ppm based on more recent studies using acceptable GLP methodology. This had no effect on the amount of refrigerant per occupied space for R-32 but did result in changes to the amount of refrigerant per occupied space for refrigerant blends containing R-32 and these have been changed accordingly (i.e. R-407A, R-407B, R-407C, R-407D, R-407E, R-410A, R-410B, R-425A, R-427A, R-438A, and R-504).

The flammability safety classifications for R-32, R-143a, R-717, and R-1234yf have been changed from 2 to 2L to reflect the addition of this new classification to ASHRAE Standard 34 for refrigerants which meet the criteria for class 2 and have a burning velocity of 3.9 in/s (10cm/s). One new refrigerant, R-1234ze(E), also has a flammability classification of 2L.

The compositions of several refrigerant blends have been updated to include the appropriate number of significant figures.

SECTION 1104, SYSTEM APPLIATION REQUIREMENTS

The sentence referring to refrigerant blends with dual classifications is being deleted since the industry no longer assigns dual classifications to refrigerant blends. Today, the worst case fractionated formulation is used to determine a single safety classification for refrigerant blends and therefore the bends have a single classification.

Cost Impact: The code change proposal will not increase the cost of construction.

M182-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-FLAMMABILITY CLASSIFICATION-M-FERGUSON.DOC

M183–12
1104.4.1

Proponent: Paul L. Doppel, Director of Industry and Government Relations, Mitsubishi Electric and Electronics USA, Inc., representing himself
(pdoppel@hvac.mea.com)

Revise as follows:

1104.4.1 Noncommunicating spaces. Where the refrigerant-containing parts of a system are located in one or more spaces that do not communicate through permanent openings or HVAC ducts, the volume of the smallest enclosed occupied space shall be used to determine the permissible quantity of refrigerant in the system. <u>Where two enclosed occupied spaces communicate through openings such as under-cut doors or transfer grilles and such openings have an area of 0.15% or more of the total floor area of the smaller enclosed occupied space in which refrigerant-containing parts are located, the two spaces shall be considered as one space.</u>

Reason: Paragraph 1104.4.1, as written, does not give enough guidance as to the allowable opening, other than HV AC ducts that allow two spaces to be considered as communication spaces. The proposed addition is based on JAPANESE STANDARD; JRA-GL13. The specific reference to"0.15% of the floor area" is used in the Mitsubishi Electric Data Book for the Mitsubishi Variable Refrigerant Flow systems as guidance for engineers using these VRF systems. This reference has been in the Mitsubishi data books and engineering manuals for many years.

Cost Impact: The code change proposal will not increase the cost of construction.

M183-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.4.1-M-DOPPEL.DOC

M184–12
1106.3

Proponent: Jeffrey Shapiro, International Code Consultants, representing International Institute of Ammonia Refrigeration
(jeff.shapiro@intlcodeconsultants.com)

Revise as follows:

1106.3 Ammonia room ventilation. Ventilation systems in ammonia machinery rooms shall be operated continuously at the ~~emergency~~ ventilation rate specified in ~~determined in~~ ~~accordance with~~ Section 1105.6.3~~.2~~.

Exceptions:

1. Machinery rooms equipped with a vapor detector that will automatically start the ventilation system at the ~~emergency~~ ventilation rate specified in ~~determined in accordance with~~ Section 1105.6.3~~.2~~, and that will actuate an alarm at a detection level not to exceed 1,000 ppm; or
2. Machinery rooms conforming to the Class 1, Division 2, *hazardous location* classification requirements of NFPA 70.

Reason: Editorial correction. A change to the 2009 code revised the ventilation rate requirements for ammonia, and the provisions are now contained in Section 1105.6.3.

Cost Impact: The code change proposal will not increase the cost of construction.

M184-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1106.3-M-SHAPIRO.DOC

M185–12
1107.1, Chapter 15

Proponent: Walter J. Sperko, Sperko Engineering Services, Inc. representing Mechanical Contractors Association of America
(Sperko@asme.org)

Revise as follows:

1107.1 General. <u>The design of refrigerant piping shall be in accordance with ASME B31.5.</u> ~~All~~ Refrigerant piping shall be installed, tested and placed in operation in accordance with this chapter.

Add new standard to Chapter 15 as follows:

<u>ASME B31.5-2001 Refrigerant Piping and Heat Transfer Components</u>

Reason: The present rules have no requirements for design, analysis, supports, stress limits or anything else regarding design of refrigerant piping. B31.5 is specifically written for refrigeration piping and provides appropriate design requirements. The addition of this requirement does not conflict with existing requirements in this chapter since it only governs design of the piping.

Cost Impact: None. Designers should be following B31.5 or similar standard already. Jurisdiction will not have to buy copies of B31.5 since the engineer will have to have a copy to demonstrate compliance and the change would not affect installation requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASME B31.5-2001] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M185-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1107.1-M-SPERKO.DOC

M186–12
1201.1

Proponent: Ed Flanagan/Mike Quiroz for Tim Sharp, Business Manager/Secretary-Treasurer, Alaska District Council of Laborers, representing the local unions and members of the Laborers Int'l Union of North America in the state of Alaska

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern the construction, installation, alteration and repair of hydronic piping systems within buildings. This chapter shall apply to hydronic piping systems that are within buildings and that are part of heating, ventilation, and air conditioning systems. Such piping systems shall include steam, hot water, chilled water, and steam condensate ~~and ground source heat pump loop~~ systems. Potable cold and hot water distribution systems shall be installed in accordance with the International Plumbing Code.

Reason: Some jurisdictions have interpreted the scope of Chapter 12 to assert applicability of the IMC to the loop fields associated with Ground Source Heat Pump installations. The IMC should regulate the pump and interior hydronic piping associated with it, but not the exterior piping of the earth connection/loop field.

Cost Impact: Costs to building or project owners should be reduced due to the cost effectiveness and efficiency gained by allowing general or utility contractors and their qualified workers (Laborer Pipelayers) to perform the heat fusion and installation of this exterior piping.

M186-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1201.1-M-FLANAGAN-QUIR0Z.DOC

M187–12
1202.3

Proponent: Steven J. Clark, P.E., Aquatherm, self (steve.clark@aquathermpipe.com)

Revise as follows:

1202.3 Material rating. Materials shall be rated for the operating temperature and pressure of the hydronic system. Materials shall be suitable for the type of fluid in the hydronic system<u>, including water, glycols, and polyolester oil and other HVAC system oils.</u>

Reason: Purpose of Code Change – To avoid system failures as a direct result of using incompatible materials.

Cost Impact: The code change proposal will not increase the cost of construction.

M187-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1202.3-M-CLARK.DOC

M188–12

Table 1202.4, 1203.15, 1208, 1210 (NEW), 1211 (NEW), 1212 (NEW), 1213 (NEW), 1214 (NEW), 1215 (NEW), 1216 (NEW), Chapter 15

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association
(mikec@cmservnet.com)

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
~~Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)~~	~~ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693~~

Portions of table not shown remain unchanged

~~**1203.15 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints conforming to Section 1203.15.1, electrofusion joints conforming to Section 1203.15.2, or stab-type insertion joints conforming to Section 1203.15.3.~~

~~**1203.15.1 Heat-fusion joints.** Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.~~

~~**1203.15.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.~~

~~**1203.15.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.~~

SECTION 1208
TESTS

1208.1 General. Hydronic piping systems ~~other than groundsource heat pump loop systems~~ shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes, but not more than 20 minutes. ~~Ground-source heat pump loop systems shall be tested in accordance with Section 1208.1.1.~~

~~**1208.1.1 Ground source heat pump loop systems.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the problem shall be identified and corrected.~~

SECTION 1210
GROUND-SOURCE HEAT PUMP LOOP SYSTEMS

1210.1 Ground-Source Heat Pump-Loop Water Piping. Ground source heat pump ground loop-piping and tubing material for water-based systems shall conform to the standards cited in this section.

1210.2 Used materials. Reused pipe, fittings, valves, and other materials shall not be permitted in ground-source heat pump loop systems.

1210.3 Material rating. Pipe and tubing shall be rated for the operating temperature and pressure of the ground source heat pump-loop system. Fittings shall be suitable for the pressure applications and recommended by the manufacturer for installation with the pipe and tubing material installed. Where used underground, materials shall be suitable for burial.

1210.4 Piping and tubing materials standards. Ground source heat pump ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

TABLE 1210.4
GROUND SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; ASTM F877 CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D3035; ASTM D2737; ASTM F714; AWWA C901; CSA B137.1; CSA C448
Polypropylene (PP-R)	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623

1210.5 Fittings. Ground source heat pump pipe fittings shall be approved for installation with the piping materials to be installed, shall conform to the standards listed in Table 1210.5 and if installed underground shall be suitable for burial.

TABLE 1210.5
GROUND SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D 2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F 877; ASTM F1807; ASTM F 1960; ASTM F 2080; ASTM F2159; ASTM F2434; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F 2434; ASTM F1282, CSA B137.9
High Density Polyethylene (HDPE~~)~~	ASTM D2683; ASTM D3261;

PIPE MATERIAL	STANDARD (see Chapter 15)
	ASTM F1055; CSA B137.1; CSA C448
Polypropylene (PP-R)	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2159; B137.1

SECTION 1211
JOINTS AND CONNECTIONS

1211.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground source -loop system. Joints used underground shall be approved for buried applications.

1211.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

1211.2 Preparation of pipe ends. Pipe shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

1211.3 Joint preparation and installation. Where required by Sections 1211.4 through 1211.6, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections 1211.3.1 and 1211.3.2.

1211.3.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1211.3.2 Thermoplastic-welded joints. Joint surfaces for thermo plastic-welded joints shall be cleaned by an approved procedure. Joints shall be welded in accordance with the manufacturer's instructions.

1211.4 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented or threaded joints complying with Section 1203.3.

1211.5 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall comply with Sections 1211.4.1 and 1211.4.2. Mechanical joints shall comply with Section 1211.3.

1211.5.1 Compression-type fittings. Where compression- type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.5.2 Plastic-to-metal connections. Soldering on the metal portion of the system shall be performed at least 18 inches (457 mm) from a plastic-to-metal adapter in the same water line.

1211.6 Polyethylene plastic pipe and tubing for ground source heat pump loop systems. Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints complying with Section 1211.6.1, electrofusion joints complying with Section 1211.6.2, or stab-type insertion joints complying with Section 1211.6.3.

1211.6.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.

1211.6.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.

1211.6.3 Stab-type insert fittings. Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.

1211.7 Polypropylene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Sections 1211.7.1 and 1211.7.2.

1211.7.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt fusion. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 2389.

1211.7.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

1211.8 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall complying with Sections 1211.8.1 and 1211.8.2. Mechanical joints shall comply with Section 1211.3.

1211.8.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.8.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe.

1211.9 PVC plastic pipe. Joints between PVC plastic pipe and fittings shall be solvent-cemented or threaded joints comply with Section 1203.3.

SECTION 1212
VALVES

1212.1 Where required. Shutoff valves shall be installed in ground source-loop piping systems in the locations indicated in Sections 1212.1.1 through 1212.1.6.

1212.1.1 Heat exchangers. Shutoff valves shall be installed on the supply and return side of a heat exchanger.

> **Exception:** Shutoff valves shall not be required where heat exchangers are integral with a boiler or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section 1005.1.

1212.1.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

1212.1.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

1212.1.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

1212.1.5 Equipment and appliances. Shutoff valves shall be installed on connections to mechanical *equipment* and appliances. This requirement does not apply to components of a ground source loop system such as pumps, air separators, metering devices, and similar *equipment*.

1212.1.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

1212.2 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section 1006.

SECTION 1213
PIPING INSTALLATION

1213.1 General. Piping, valves, fittings, and connections shall be installed in accordance with the conditions of approval.

1213.3 Protection of potable water. Where ground source heat pump ground loop systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with the *International Plumbing Code*.

1213.4 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with the *International Building Code*.

1213.5 Clearance from combustibles. A pipe in a ground source heat pump piping system having an exterior surface temperature exceeding 250°F (121°C) shall have a minimum *clearance* of 1 inch (25 mm) from combustible materials.

1213.6 Contact with building material. A ground source heat pump ground-loop piping system shall not be in direct contact with building materials that cause the piping or fitting material to degrade or corrode, or that interfere with the operation of the system.

1213.7 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

1213.7.1 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the *design flood elevation*.

1213.8 Pipe support. Pipe shall be supported in accordance with Section 305.

1213.9 Velocities. Ground source heat pump ground-loop systems shall be designed so that the flow velocities do not exceed the maximum flow velocity recommended by the pipe and fittings manufacturer and shall be controlled to reduce the possibility of water hammer.

1213.10 Labeling and Marking. Ground source heat pump ground-loop system piping shall be marked with tape, metal tags or other method where it enters a building indicating “GROUND SOURCE HEAT PUMP-LOOP SYSTEM”. The marking shall indicate any antifreeze used in the system by name and concentration.

1213.11 Chemical Compatibility. Antifreeze and other materials used in the system shall be chemically compatible with the pipe, tubing, fittings, and mechanical systems.

SECTION 1214
WORKING FLUID

1214.1 Makeup water. The transfer fluid shall be compatible with the makeup water supplied to the system.

SECTION 1215
TESTS

1215.1 Ground source heat pump loop systems. Before connection header trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes, but not more than 35 minutes, with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the cause shall be identified and corrective action taken.

SECTION 1216
EMBEDDED PIPING

1216.1 Pressurizing during installation. Ground source heat pump ground loop piping to be embedded in concrete shall be pressure tested prior to pouring concrete. During pouring, the pipe shall be maintained at the proposed operating pressure.

Add new standard as follows:

CSA C448 SERIES-02-CAN/CSA-2002
Design and Installation of Earth Energy Systems - First Edition; Update 2: October 2009; Consolidated Reprint 10/2009

Reason: Water based geothermal PE piping is currently listed in the hydronics section where it doesn't quite fit. This special and growing application should have its own section, and it should cover other materials that could potentially be used. Green building rating systems are promoting geothermal ground loop heating and cooling systems, and the code should have more information. I am re-introducing this proposal to accomplish that and would accept friendly amendments to it for any other materials. While HDPE dominates the water based technology with an expected 95% of the systems, other materials can be utilized. Copper is used in direct expansion systems that do not run on water.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [CSA C448 SERIES-02-CAN/CSA-2002] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M188-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.4-M-CUDAHY.DOC

M189–12
Table 1202.4, Chapter 15

Proponent: James Gilchrist, P.E., Georg Fischer Sloane, LLC, representing GF Piping Systems (jim.gilchrist@georgfischer.com)

Revise as follows:

Table 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527; ~~ASTM D 2282~~ F2806
……	
~~Polybutylene (PB) plastic pipe and tubing~~	~~ASTM D3309~~
……	
Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)	ASTM D 2513; ASTM D 3035; ~~ASTM D 2447~~; ASTM D 2683; ASTM F 1055; ~~ASTM D 2837~~; ~~ASTM D 3350;~~ ~~ASTM D 1693~~
…..	

Portions not shown remain unchanged.

Add new standard to Chapter 15 as follows:

ASTM F2806-10
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Metric SDR-PR)

Reason: Updates to this table are needed so that it is aligned with current ASTM standards for plastic pipe and fittings. Also, several standards are included which are incorporated into product standards but are not product standards themselves. For clarity these should be removed.

-D2282 was withdrawn in 2007 without replacement. ASTM F2806-10e1, "Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Metric SDR-PR)," was approved in 2010.
-D3309 was withdrawn in 2010 without replacement. Polybutylene pipe is not currently manufactured or used in the United States for this application.
-D2447 was withdrawn in 2010 without replacement.
-ASTM D2837 - 11 "Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products," is a test method, not a specification for PE pipe and fittings.
-ASTM D3350 - 10a "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials," is a specification for materials, not finished product.
-ASTM D1693 - 08 "Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics," is a test method, not a specification for PE pipe and fittings.

Copy of new standard, ASTM F2806-10e1, is attached in PDF form.

Cost Impact: The code change proposal will not increase the cost of construction. The change only aligns the code with current ASTM standards.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM F2806-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M189-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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M190–12
TABLE 1202.4, 1203.15, 1208, 1210-1216 (NEW), Chapter 15

Proponent: Jeremy Brown, NSF International, (brown@nsf.org)

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
~~Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)~~	~~ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693~~

Other sections of table unchanged

~~**1203.15 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints conforming to Section 1203.15.1, electrofusion joints conforming to Section 1203.15.2, or stab-type insertion joints conforming to Section 1203.15.3.~~

~~**1203.15.1 Heat-fusion joints.** Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.~~

~~**1203.15.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.~~

~~**1203.15.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.~~

SECTION 1208
TESTS

1208.1 General. Hydronic piping systems ~~other than groundsource heat pump loop systems~~ shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes, but not more than 20 minutes. ~~Ground-source heat pump loop systems shall be tested in accordance with Section 1208.1.1.~~

~~**1208.1.1 Ground source heat pump loop systems.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the problem shall be identified and corrected.~~

SECTION 1210
GROUND-SOURCE HEAT PUMP LOOP SYSTEMS

1210.1 Ground Source-Loop Water Piping. Ground source loop-piping and tubing material for water-based systems shall conform to the standards cited in this section.

1210.2 Used materials. Reused pipe, fittings, valves, and other materials shall not be permitted in ground source-loop systems.

1210.3 Material rating. Pipe and tubing shall be rated for the operating temperature and pressure of the ground-loop system. Fittings shall be suitable for the pressure applications and recommended by the manufacturer for installation with the pipe and tubing material installed. Where used underground, materials shall be suitable for burial.

1210.4 Piping and tubing materials standards. Ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

TABLE 1210.4
GROUND SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; ASTM F877 CSA B137.5;NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D3035; ASTM D2737; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623

1210.5 Fittings. Ground source pipe fittings shall be approved for installation with the piping materials to be installed shall conform to the standards listed in Table 1210.5 and if installed underground shall be suitable for burial.

TABLE 1210.5
GROUND SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D 2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F 877; ASTM F1807; ASTM F 1960; ASTM F 2080; ASTM F2159; ASTM F2434; CSA B137.5; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F 2434; ASTM F1282, CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261;

	ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2159; B137.1

SECTION 1211
JOINTS AND CONNECTIONS

1211.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground source-loop system. Joints used underground shall be approved for buried applications.

1211.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

1211.2 Preparation of pipe ends. Pipe shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

1211.3 Joint preparation and installation. Where required by Sections 1211.4 through 1211.6, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections 1211.3.1 and 1211.3.2.

1211.3.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1211.3.2 Thermoplastic-welded joints. Joint surfaces for thermo plastic-welded joints shall be cleaned by an approved procedure. Joints shall be welded in accordance with the manufacturer's instructions.

1211.4 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented or threaded joints complying with Section 1203.3.

1211.5 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall comply with Sections 1211.4.1 and 1211.4.2. Mechanical joints shall complying with Section 1211.3.

1211.5.1 Compression-type fittings. Where compression- type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.5.2 Plastic-to-metal connections. Soldering on the metal portion of the system shall be performed at least 18 inches (457 mm) from a plastic-to-metal adapter in the same water line.

1211.6 Polyethylene plastic pipe and tubing for ground source heat pump loop systems. Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints complying with Section 1211.6.1, electrofusion joints complying with Section 1211.6.2, or stab-type insertion joints complying with Section 1211.6.3.

1211.6.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.

1211.6.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.

1211.6.3 Stab-type insert fittings. Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.

1211.7 Polypropylene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Sections 1211.7.1 and 1211.7.2.

1211.7.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt fusion. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 2389.

1211.7.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

1211.8 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall complying with Sections 1211.8.1 and 1211.8.2. Mechanical joints shall complying with Section 1211.3.

1211.8.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.8.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe.

1211.9 PVC plastic pipe. Joints between PVC plastic pipe and fittings shall be solvent-cemented or threaded joints complying with Section 1203.3.

SECTION 1212
VALVES

1212.1 Where required. Shutoff valves shall be installed in ground source-loop piping systems in the locations indicated in Sections 1212.1.1 through 1212.1.6.

1212.1.1 Heat exchangers. Shutoff valves shall be installed on the supply and return side of a heat exchanger.

Exception: Shutoff valves shall not be required where heat exchangers are integral with a boiler or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section 1005.1.

1212.1.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

1212.1.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

1212.1.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

1212.1.5 Equipment and appliances. Shutoff valves shall be installed on connections to mechanical *equipment* and appliances. This requirement does not apply to components of a ground source loop system such as pumps, air separators, metering devices, and similar *equipment*.

1212.1.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

1212.2 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section 1006.

SECTION 1213
PIPING INSTALLATION

1213.1 General. Piping, valves, fittings, and connections shall be installed in accordance with the conditions of approval.

1213.3 Protection of potable water. Where ground source loop systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with the *International Plumbing Code*.

1213.4 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with the *International Building Code*.

1213.5 Clearance from combustibles. A pipe in a ground source piping system having an exterior surface temperature exceeding 250°F (121°C) shall have a minimum *clearance* of 1 inch (25 mm) from combustible materials.

1213.6 Contact with building material. A ground source-loop piping system shall not be in direct contact with building materials that cause the piping or fitting material to degrade or corrode, or that interfere with the operation of the system.

1213.7 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

1213.7.1 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the *design flood elevation*.

1213.8 Pipe support. Pipe shall be supported in accordance with Section 305.

1213.9 Velocities. Ground source-loop systems shall be designed so that the flow velocities do not exceed the maximum flow velocity recommended by the pipe and fittings manufacturer and the velocities shall be controlled to reduce the possibility of water hammer.

1213.10 Labeling and Marking. Ground source-loop system piping shall be marked with tape, metal tags or other method where it enters a building indicating “GROUND SOURCE-LOOP SYSTEM”. The marking shall indicate any antifreeze used in the system by name and concentration.

1213.11 Chemical Compatibility. Antifreeze and other materials used in the system shall be chemically compatible with the pipe, tubing, fittings, and mechanical systems.

SECTION 1214
WORKING FLUID

1214.1 Makeup water. The transfer fluid shall be compatible with the makeup water supplied to the system.

SECTION 1215
TESTS

1215.1 Ground source heat pump loop systems. Before connection header trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes, but not more than 35 minutes, with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the cause shall be identified and corrective action taken.

SECTION 1216
EMBEDDED PIPING

1216.1 Pressurizing during installation. Ground loop piping to be embedded in concrete shall be pressure tested prior to pouring concrete. During pouring, the pipe shall be maintained at the proposed operating pressure.

Add new standards to Chapter 15 as follows:

ASTM

D2737-12
Standard Specification for Polyethylene (PE) Plastic Tubing

F437-09
Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80

F714-10
Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

F1282–10
Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe

F1960-11e1
Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing

F2434-09
Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing

AWWA

C901-08
AWWA Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) through 3 In. (76 mm), for Water Service

CSA

B137.1-09 Polyethylene (PE) pipe, tubing, and fittings for cold-water pressure services

B137.2-05 Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications

B137.3-09 Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications

B137.5-09 Crosslinked polyethylene (PEX) tubing systems for pressure applications

B137.11-99 Polypropylene (PP-R) Pipe and Fittings for Pressure Applications

C448-10/2009
Design and Installation of Earth Energy Systems - First Edition; Update 2: October 2009; Consolidated Reprint

NSF

358-1
Polyethylene Pipe and Fittings for Water-Based Ground-Source (Geothermal) Heat Pump Systems

358-2
Polypropylene Pipe and Fittings for Water-Based Ground-Source(Geothermal) Heat Pump Systems

358-3
Cross-linked Polyethylene (PEX) Pipe and Fittings for Water-Based Ground-Source (Geothermal) Heat Pump Systems

Reason: The IMC requires improvement on the approved materials for us in geothermal systems. While Polyethylene pipe and fittings dominates the current geothermal market, other materials are appropriate.

At the time of submission of proposals, NSF is in the process of writing NSF Series of Standards 358 to address material specific requirements for plastic piping system components used in geothermal systems. The standard can be obtained from brown@nsf.org.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [ASTM D2737-12, F437-09, F714-10, F1282–10, F1960-11e1, F2434-09; AWWA C901-08; CSA B137.1-09, B137.2-05, B137.3-09, B137.5-09, B137.11-99, C448-10/2009; NSF 358-1, 358-2, 358-3.] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M190-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.4-M-BROWN.DOC

M191–12
Table 1202.4

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527; ASTM D 2282
~~Brass pipe~~	~~ASTM B 43~~
~~Brass tubing~~	~~ASTM B 135~~
Copper or copper-alloy pipe	ASTM B 42; ASTM B 43; ASTM B 302
Copper or copper-alloy tube (Type K, L or M)	ASTM B 75; ASTM B 88; ASTM B 135 ASTM B 251

Reason: Brass pipe and tubing are copper alloys. Moving brass under the applicable heading cleans-up the table and provides the appropriate terminology and correct information to the end user.

Cost Impact: This code change will not increase the cost of construction.

M191-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.4-M-FEEHAN.DOC

M192–12
TABLE 1202.5, Chapter 15

Proponent: Kevin J. Simko, Victaulic, representing Victaulic

Revise as follows:

MATERIAL	STANDARD
Brass	ASTM F 1974
Bronze	ASTM B 16.24
Copper or copper alloy	ASME BI6.15; ASME BI6.18; ASME BI6.22; ASME BI6.23; ASME BI6.26; AS ME BI6.29; ASTM B 75; ASTM B 152; ASTM B 584
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; A WWA C153/A21.53; ASTM A 395; ASTM A 536; ASTM F 1476; ASTM F 1548
Ductile Iron	ANSI/AWWA *C153/A21.53*
Gray Iron	ASTM A 126
Malleable iron	ASME BI6.3
PEX fittings	ASTM F 877; ASTM F 1807; ASTM F 2159
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F2389; ASTM F 2735
Steel	ASME BI6.5; ASME BI6.9; ASME B16.11; ASME BI6.28; ASTM A 53; ASTM A 106; ASTM A 234; ASTM A 420; ASTM A 536; ASTM A 395; ASTM F 1476; ASTM F 1548

Portions not shown remain unchanged.

Add new standards to Chapter 15 as follows:

ASTM A234 / A234M - 11a
Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM A395 / A395M - 99(2009)
Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures

ASTM A536 - 84(2009)
Standard Specification for Ductile Iron Castings

ASTM B152 / B152M – 09
Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar

ASTM B584 – 11
Standard Specification for Copper Alloy Sand Castings for General Applications

ASTM F1548 - 01(2006)
Standard Specification for the Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications

AWWA C153/A21.53-06
Ductile-Iron Compact Fittings for Water Service

Reason: The materials currently listed in Table 1202.5 do not fully represent the materials being used for hydronic systems in the industry. ,the code is overly restrictive with regard to pipe materials and does not allow for the use of materials that offer improved mechanical and electrochemical properties compared with allowed materials. The addition of these standard materials will allow the use of high grade materials that provide improved performance, while still allowing the use of currently approved materials. Many of these materials are also currently referenced in other piping codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM A234 / A234M - 11a, A395 / A395M - 99(2009), A536 - 84(2009), B152 / B152M – 09, B584 – 11, F1548 - 01(2006); AWWA C153/A21.53-06] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M192-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.5-M-SIMKO.DOC

M193–12
Table 1202.5

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD
~~Brass~~	~~ASTM F 1974~~
~~Bronze~~	~~ASTM B16.24~~
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ~~ASME B16.23;~~ ASME B16.26; ASTM F1974, ASTM B16.24, ~~ASME B16.29~~

(Portions of table not shown remain unchanged.)

Reason: Brass and Bronze are copper alloys. Moving the standards under the applicable heading cleans-up the table and provides the appropriate terminology and correct information to the end user.

ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV and ASME B 16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV, are Drain, Waste, and Vent fittings and should not be listed here.

Cost Impact: This code change will not increase the cost of construction.

M193-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.5-M-FEEHAN.DOC

M194–12
TABLE 1202.5, Chapter 15

Proponent: James Gilchrist, P.E., Georg Fischer Sloane, LLC, representing Georg Fischer Piping Systems
(jim.gilchrist@georgfischer.com)

Revise as follows:

Table 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
<u>Thermoplastic</u> ~~Plastic~~	ASTM D 2466; ASTM D 2467; ~~ASTM D 2468~~; <u>ISO 15493 Annex A</u>; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F 2389; ASTM F 2735

(Portions of table not shown remain unchanged.)

Add new standard to Chapter 15 as follows:

<u>ISO 15493 Annex A-2003</u>
<u>Plastics piping systems for industrial applications - Acrylonitrile-butadiene-styrene (ABS), unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C) - Specifications for components and the system Metric series</u>

Reason: Updates to this table are needed so that it is aligned with current ASTM and ISO standards for plastic pipe and fittings.
-Using the term "Thermoplastic" differentiates these materials from the newer material PEX, which is a thermoset.
-ASTM D2468 - 96a Standard "Specification for Acrylonitrile Butadiene Styrene (ABS) Plastic Pipe Fittings, Schedule 40" was withdrawn in 2003 without replacement.
-ISO 15493 Annex A defines ABS fittings that are compatible with hydronic cooling pipe. ISO 15493:2003 Plastics piping systems for industrial applications -- Acrylonitrile-butadiene-styrene (ABS), unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C) -- Specifications for components and the system -- Metric series
Copy of ISO 15493 is attached in PDF form.

Cost Impact: The code change proposal will not increase the cost of construction. The change only aligns the code with current standards.

Analysis: A review of the standard proposed for inclusion in the code, [ISO 15493 Annex A-2003] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M194-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.5#2-M-GILCHRIST.DOC

M195–12
T1202.5, Chapter 15

Proponent: Robert Hall, SE Technical Manager, representing Viega, LLC

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIALS	STANDARDS
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME 16.26; ASME B16.29; ASME B16.51, ICC LC 1002

(Portions of table not shown remain unchanged)

Add new standards to Chapter 15 as follows:

ASME B16.51-11
Copper and Copper Alloy Press-Connect Pressure Fittings

ICC LC 1002-08
PMG Listing Criteria for Press-Connection Fittings for Potable Water Tube and Radiant Heating Systems

Reason: New, ASME Material Standard for Press-Connect fittings and ICC Standard.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [ASME B16.51-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M195-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.5 #1-M-HALL.DOC

M196–12
Table 1202.5, Chapter 15

Proponent: Larry Gill, P.Eng. IPEX USA LLC
(larry.gill@ipexna.com)

Revise as follows:

TABLE 1202.5
PIPE FITTINGS

Material	**Standard**
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F 2389, ASTM F2735, <u>ASTM F 2769, ASTM F2159, ASTM F2098</u>

(Portions of table not shown remain unchanged)

Add new standards to Chapter 15 as follows:

<u>ASTM F2098-08</u>
<u>Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings</u>

Reason: Add new standards for PE-RT fittings. ASTM 2159 and F2098 are fittings standards and ASTM F2769 is a standard for hot and cold water tubing and distribution systems and includes provisions for tubing, fittings, valves and manifolds.

Cost Impact: The proposed change will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM F2098-08] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M196-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T605.5 #2-M-GILL.DOC

M197–12
Table 1202.5, 1209.3.4(New), Chapter 15

Proponent: Larry Gill, P.Eng. IPEX USA LLC
(larry.gill@ipexna.com)

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITINGS

MATERIAL	STANDARD (see chapter 15)
PE-RT fittings	ASTM F 1807, ASTM F 2098, ASTM F2159, ASTM F 2735, ASTM F2769

(Portions of table not shown remain unchanged)

SECTION 1209
EMBEDDED PIPING

1209.3.4 Polyethylene of raised temperature (PE-RT) joints. PE-RT tubing shall be installed in continuous lengths or shall be joined by hydronic fittings listed in Table 1202.5.

Add new standard to Chapter 15 as follows:

ASTM F2098 – 08
Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings

Reason: Add new requirements for PE-RT fittings. ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735 are fittings standards and ASTM F2769 is a standard for hot and cold water tubing and distribution systems and includes provisions for tubing, fittings, valves and manifolds.

Cost Impact: The proposed change will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM F2098 - 08] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M197-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1209.3.4(NEW)-M-GILL.DOC

M198–12
TABLE 1202.5, Chapter 15

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., Self

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

Material	Standards
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29, ASME B16.51

(Portions of table not shown remain unchanged.)

Add referenced standards to Chapter 15 as follows:

ASME B16.51-2011
Copper and Copper Alloy Press-Connect Pressure Fittings Table 605.5

Reason: This adds the new standard for copper press connect fittings. ASME B16.51 was published in December 2011. The standard regulates the size, design, and performance requirements for press connect fittings.

Cost Impact: This change does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASME B16.51-2011] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M198-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1202.5-M-BALLANCO.DOC

M199–12
1203.1 thru 1203.8.3, Chapter 15

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

Revise as follows:

1203.3.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with brazing alloys having a liquid temperature exceeding 1000˚F (538˚C). Joint surfaces to be brazed shall be cleaned bright by manual or mechanical means. The ends of the tubing shall be cut square and reamed to full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Where required by the brazing alloy manufacturer's instructions, an *approved* brazing flux shall be applied to the joint surfaces ~~where required~~. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

1203.3.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Joints shall include compression, flanged, grooved, press type and threaded.

1203.3.3 Soldered joints. Solder joints ~~surfaces shall be cleaned~~. between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. The ends of the pipe or tubing shall be cut square and reamed to the full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Joint surfaces to be joined shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to pipe or tubing and fittings. Such flux shall become noncorrosive and nontoxic after soldering ~~shall be applied~~. Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and pipe or tubing. ~~The joint shall be soldered with a~~ Solder in compliance with ~~conforming to~~ ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint. The joining of water supply piping shall be made with lead-free solder and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.

1203.3.4 Flared joints. Flared joints shall be made by a tool designed for that operation.

1203.3.5 Push-fit joints. Push-fit joints shall be installed in accordance with the manufacturer's instructions.

1203.3.6 Press joints. *Press joints* shall be installed in accordance with the manufacturer's instructions.

1203.3.7 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall conform to the requirements of ASTM F 1476 and shall be installed in accordance with the manufacturer's instructions.

1203.3.8 Mechanically formed tee fittings. Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.

1203.3.8.1 Full flow assurance. Branch tubes shall not restrict the flow in the run tube. A dimple/depth stop shall be formed in the branch tube to ensure that penetration into the outlet is of the correct depth. For inspection purposes, a second dimple shall be placed 1/4 inch (6.4 mm) above the first dimple.

Dimples shall be aligned with the tube run.

1203.3.8.2 Brazed joints. Mechanically formed tee fittings shall be brazed in accordance with Section 1203.3.1.

1203.~~3.4~~ 3.9 Solvent-cemented joints. Joint surfaces shall be clean and free of moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D 2235 for ABS joints.
2. ASTM F 493 for CPVC joints.
3. ASTM D 2564 for PVC joints.
   CPVC joints shall be made in accordance with ASTM D 2846.

Exception: For CPVC pipe joint connections, a primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F 493.
2. The solvent cement is yellow in color.
3. The solvent cement is used only for joining ½ inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846.

1203.3.~~5~~10 Threaded joints. Threads shall conform to ASME B1.20.1. Schedule 80 or heavier plastic pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant, pipe-joint compound or tape shall be applied on the male threads only and shall be *approved* for application on the piping material.

1203.3.~~6~~11 Welded joints. Joint surfaces shall be cleaned by an *approved* procedure. Joints shall be welded with an *approved* filler metal.

~~**1203.3.7 Grooved and shouldered mechanical joints.** Grooved and shouldered mechanical joints shall conform to the requirements of ASTM F 1476 and shall be installed in accordance with the manufacturer's installation instructions.~~

~~**1203.3.8 Mechanically formed tee fittings.** Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.~~

~~**1203.3.8.1 Full flow assurance.** Branch tubes shall not restrict the flow in the run tube. A dimple/depth stop shall be formed in the branch tube to ensure that penetration into the outlet is of the correct depth. For inspection purposes, a second dimple shall be placed 1/4 inch (6.4 mm) above the first dimple. Dimples shall be aligned with the tube run.~~

~~**1203.3.8.2 Brazed joints.** Mechanically formed tee fittings shall be brazed in accordance with Section 1203.3.1.~~

~~**1203.4 ABS plastic pipe.** Joints between ABS plastic pipe or fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.~~

~~**1203.5 Brass pipe.** Joints between brass pipe or fittings shall be brazed, mechanical, threaded or welded joints conforming to Section 1203.3.~~

~~**1203.6 Brass tubing.** Joints between brass tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3.~~

~~**1203.7 Copper or copper-alloy pipe.** Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, soldered, threaded or welded joints conforming to Section 1203.3.~~

~~**1203.8 Copper or copper-alloy tubing.** Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3, flared joints conforming to Section 1203.8.1, push-fit joints conforming to Section 1203.8.2 or press-type joints conforming to Section 1203.8.3.~~

~~**1203.8.1 Flared joints.** Flared joints shall be made by a tool designed for that operation.~~

~~**1203.8.2 Push-fit joints.** Push-fit joints shall be installed in accordance with the manufacturer's instructions.~~

~~**1203.8.3 Press joints.** *Press joints* shall be installed in accordance with the manufacturer's instructions.~~

Add new standard to Chapter 15 as follows:

<u>ASTM B828 - 02(2010)</u>
<u>Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings</u>

Reason: The above proposal adds important language from the applicable standards, relocated, renumbered, and deleted other redundant sections to help the end user.

Cost Impact: This code change will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM B828 - 02(2010)], with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M199-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.3.1-M-FEEHAN.DOC

M200–12
1203.3.9(NEW)

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC

Add new text as follows:

1203.3.9 Press Connect Joints. Press connect joints shall be installed in accordance with the manufacturer's instructions. Press-connect joints shall conform to one of the standards listed in Table 1202.5.

Reason: Need press connect fittings reference in Section 1203.3 Joint preparation and installation.

Cost Impact: None

M200-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.3.9-M-HALL.DOC

M201–12
1203.3.9 (NEW)

Proponent: Kevin Simko, Victaulic, representing Victaulic
(ksimko@victaulic.com)

Add new text as follows:

1203.3.9 Mechanical joints for branch lines. Mechanical joint fittings that are used to create branch openings in a pipe run shall incorporate a locating collar, designed for alignment to prevent the rotation of the mechanical joint after installation. The locating collar shall extend into a predrilled hole in the pipe. The mechanical joint fitting shall be installed in accordance with the manufacturer's installation instructions, and be made with an approved elastomeric seal.

Reason: There is no provision in the IMC allowing or prohibiting the use of mechanical joints for branch lines. Mechanical joints for branch lines are commonly used in HVAC applications. Materials are the same used in other acceptable products.

Cost Impact: The code change proposal will not increase the cost of construction.

M201-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.3.9(NEW)-M-SIMKO.DOC

M202–12
1203.8

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Revise as follows:

1203.8 Copper and copper alloy tubing. Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical, press connect or soldered joints conforming to Section 1203.3, flared joints conforming to Section 1203.8.1, push-fit joints conforming to Section 1203.8.2 or press-type joints conforming to Section 1203.8.3.

Reason: Press connect should be included in this copper and copper alloy tubing section.

Cost Impact: None

M202-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1203.8-M-HALL.DOC

M203–12
1206.9

Proponent: Walter J. Sperko, Sperko Engineering Services, Inc. representing Mechanical Contractors Association of America
(Sperko@asme.org)

Revise as follows:

1206.9 Strains and stresses. ~~Piping shall be installed so as to prevent detrimental strains and stresses in the pipe.~~ Piping systems shall be designed in accordance with ASME B31.9. Provisions shall be made to protect piping from damage resulting from ~~expansion, contraction and~~ structural settlement. ~~Piping shall be installed so as to avoid structural stresses or strains within building components.~~ The effects of piping loads on other building components shall be evaluated by the designer.

Reason: Avoiding detrimental stresses and strains has to be an engineering consideration at the design stage; they cannot be controlled or limited as part of installation. Further, jurisdiction has no way to determine if there are detrimental stresses or strains unless there is a requirement to analyze the design, supports and restraints and there is a basis for determining if the stresses and strains are or are not acceptable. ASME B31.9 requires analysis of the design and comparison to stress limits and imposing it will ensure that detrimental stresses and strains are avoided. Part of the analysis of the design requires evaluation of the piping for effects associated with expansion and contraction.

It is not possible to comply with the present requirement to avoid piping-induced stresses and strains within other building components if the pipe is attached to those components in any way. Loads on building components to which piping is attached, however, can and should be evaluated during the design process.

Cost Impact: None. Designers should be following B31.9 or similar standard already. Jurisdiction will not have to buy copies of B31.9 since the engineer will have to have a copy to demonstrate compliance.

M203-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1206.9-M-SPERKO.DOC

M204–12
1206.10

Proponent: Walter J. Sperko, Sperko Engineering Services, Inc. representing Mechanical Contractors Association of America
(Sperko@asme.org)

Revise as follows:

1206.10 Pipe support. Pipe shall be supported in accordance with Section 305 or as specified by the designer.

Reason: While Table 305.4 is a good average guideline, a 12 foot for spacing between supports, it is a little excessive for NPS 1 pipe and way overly conservative for NPS 16 and larger which should be more like 30 feet between supports. The requirements for spacing between supports are integral to the design, the layout and results of analysis of the piping system and should be the responsibility of the piping system designer.

Cost Impact: None. Designers should be following B31.9 or similar standard already. Jurisdiction will not have to buy copies of B31.9 since the engineer will have to have a copy to demonstrate compliance and the change would not affect other installation requirements since this change only affects support spacing and requires the designer to specify it or default to Section 305 which provides a table or allows use of MSS SP-69 which costs $218.00.

M204-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1206.10-M-SPERKO.DOC

M205–12
1209.5

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

1209.5 Thermal barrier required. Radiant floor <u>and snow melt</u> heating systems shall be provided with a thermal barrier in accordance with Sections 1209.5.1 through 1209.5.4.

Reason: This is a simple clarification to include snow melt systems as this is what was always intended to be included.

Cost Impact: None

M205-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1209.5-M-MCMANN.DOC

M206–12
1209.3.2

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

1209.3.2 Copper tubing joints. Copper tubing shall be joined by brazing <u>complying with Section 1203.3.1.</u> ~~with filler metals having a melting point of not less than 1,000°F (538°C).~~

Reason: The proposed language refers the end user to the appropriate code section with important language from the applicable standards.

Cost Impact: This code change will not increase the cost of construction.

M206-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1209.3.2-M-FEEHAN.DOC

M207–12
1209.5.1

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself

Revise as follows:

1209.5.1 Slab-on-grade installation. Radiant piping utilized in concrete slab ~~on-grade~~ applications shall be provided with insulating materials installed beneath the piping for the entire slab, regardless of depth below grade, The insulation shall have an R-value of not less than 5.

Reason: The current code language only addresses slab on grade applications in which radiant piping is utilized. Significant heat loss is also associated with slabs associated with basements that are not at grade. The ground acts as a heat sink, pulling away heat from the radiant piping. Although the temperature of the dirt beneath a basement concrete floor may not be exposed to temperatures as cold as those associated with a slab on grade installation, it is well acknowledged that the ground beneath the slab will be cooler and will reduce a radiant system's efficiency.

Cost Impact: The code change proposal will increase the cost of construction. Cost of minimum R-5 insulation for placement under slab is estimated to be offset by the increased efficiency of the radiant piping system.

M207-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1209.5.1-M-DAHMEN.DOC

M208–12
Table 1302.3

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
~~Brass pipe~~	~~ASTM B 43~~
~~Brass tubing~~	~~ASTM B 135~~
Copper or copper-alloy pipe	ASTM B 42; <u>ASTM B 43;</u> ASTM B 302
Copper or copper-alloy tube (Type K, L or M)	ASTM B 75; ASTM B 88; <u>ASTM B 135</u> ASTM B 280

(*Portions of table not shown remain unchanged)*

Reason: Brass pipe and tubing are copper alloys. Moving brass under the applicable heading cleans-up the table and provides the appropriate terminology and correct information to the end user.

Cost Impact: This code change will not increase the cost of construction.

M208-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1302.3-M-FEEHAN.DOC

M209–12
1303.3 through 1303.7

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

1303.3 Joint preparation and installation. Where required by Sections 1303.4 through 1303.10, the preparation and installation of brazed, mechanical, threaded and welded joints shall comply with Sections 1303.3.1 through 1303.3.~~4~~5.

1303.3.1 Brazed joints. ~~All~~ Brazed joint between copper pipe or tubing and fittings shall be made with brazing alloys having a liquid temperature above 1000˚F (538˚C). All joints surfaces to be brazed shall be cleaned. An *approved* brazing flux shall be applied to the joint surfaces where required by manufacturer's recommendation. The joints shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

1303.3.5 Flared joints. Flared joints shall be made by a tool designed for that operation.

~~**1303.4 Brass pipe.** Joints between brass pipe or fittings shall be brazed, mechanical, threaded or welded joints complying with Section 1303.3.~~

~~**1303.5 Brass tubing.** Joints between brass tubing or fittings shall be brazed or mechanical joints complying with Section 1303.3.~~

~~**1303.6 Copper or copper-alloy pipe.** Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, threaded or welded joints complying with Section 1303.3.~~

1303.7 ~~**Copper or copper-alloy tubing.** Joints between copper or copper-alloy tubing or fittings shall be brazed or mechanical joints complying with Section 1303.3 or flared joints. Flared joints shall be made by a tool designed for that operation.~~

Reason: The proposed removes unnecessary language and adds important language from the applicable standards.

Cost Impact: This code change will not increase the cost of construction.

M209-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1303.3-M-FEEHAN.DOC

M210–12
1303.3.2

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC

Revise as follows:

1303.3.2 MECHANICAL JOINTS. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Press connect joints shall conform to one of the standards listed in Table 1302.3.

Reason: ASME B16.51 is the standard for copper tube press connections for use in oil piping systems.

Cost Impact: None

M210-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

202-MECHANICAL JOINT-M-HALL.DOC

M211–12
1303.7

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Revise as follows:

1303.7 Copper or copper-alloy tubing. Joints between copper or copper alloy pipe or fittings shall be brazed, ~~or~~ mechanical joints complying with Section 1303.3, press connect joints that conform to one of the standards in Table 1302.2 or flared joints. Flared joints shall be made by a tool designed for that operation.

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (See Chapter 15)
Copper or Copper alloy tubing	ASTM B 75; ASTM B 88; ASTM B 280; ASME B16.51

(Portions of table not shown remain unchanged)

Add standard to Chapter 15 as follows:

ASME B16.51-2012 Copper and copper-alloy press-connect pressure fittings

Reason: The proposed change refers the reader to Table 1303.2 which references ASME B16.51 the copper tube press connection fitting standard for use in oil piping systems. ASME B16.51 is the standard for copper tube press connections for use in oil piping systems.

Cost Impact: This proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASME B16.51-2012] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M211-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T1302.2-1303.7-M-HALL.DOC

M212–12
1303.9

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Revise as follows:

1303.9 Steel pipe. Joints between steel pipe or fittings shall be threaded, ~~or~~ welded joints complying with Section 1303.3, mechanical joints complying with Section 1303.9.1 or press connect joints that conform to one of the standards in Table 1302.2. ~~complying with Section1303.9.1~~.

Reason: The proposed change refers the reader to Table 1303.2 which, depending upon the outcome of M211-12, will reference the steel pipe press connection fitting standard for use in oil piping systems.

Cost Impact: None

M212-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1303.9-M-HALL.DOC

M213–12
1401.1, 1405 (NEW), Chapter 15

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

1401.1 Scope. This chapter shall govern the design, construction, installation, *alteration* and repair of systems, *equipment* and appliances intended to utilize solar energy for space heating or cooling, domestic hot water heating, swimming pool heating ~~or~~ process heating or generation of electricity.

1405 PHOTOVOLTAIC SYSTEMS

1405.1 General. This section provides for the design, construction, installation, alteration, and repair of photovoltaic equipment and systems.

1405.2 Requirements. The installation, inspection, maintenance, repair and replacement of photovoltaic systems and all system components shall comply with the manufacturer's instructions, Sections 1405.1.1 through 1405.2.3 and NFPA 70.

1405.2.1 Roof-mounted panels and modules. Where photovoltaic panels and modules are installed on roofs, the roof shall be constructed to support the loads imposed by such modules. Roof-mounted photovoltaic panels and modules that serve as roof covering shall conform to the requirements for roof coverings in the *International Building Code*. Where mounted on or above the roof coverings, the photovoltaic panels and modules and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

1405.2.2 Roof and wall penetrations. Roof and wall penetrations shall be flashed and sealed in accordance with the *International Building Code* to prevent entry of water, rodents, and insects.
1405.2.3 Ground-mounted panels and modules. Ground-mounted panels and modules shall be installed in accordance with the manufacturer's instructions.

1405.3 Photovoltaic panels and modules. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703.

1405.4 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

Add new text as follows:

306.5.2 Solar photovoltaic panels,modules and arrays. Solar photovoltaic panels, modules and arrays installed upon a roof or as an integral part of a roof assembly shall comply with the requirements of the *International Building Code* and the *International Fire Code*.

Add new referenced standards to Chapter 15 as follows:

UL 1703-02
Standard for Flat-Plate Photovoltaic Modules and Panels

UL 1741-99
Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources

Reason: Section 304.11 and Section 306 do not address photovoltaic PV) solar panels and this has caused interpretation issues. The 2012 IFC now covers PV solar panels. Since there is a solar Chapter 14 in the IMC and solar is going to be growing, shouldn't

PV be covered in the IMC? The scope of Chapter 14 needs to be changed to include PV collectors, otherwise, Section 306 could not be applied to PV because it is not currently within the scope of the code. Section 101.2 speaks of “equipment specifically addressed herein” and PV is not addressed in the code. The new Section 1405 is duplicated text from Section M2302 of the IRC. Section 1401.1 has to be changed to bring PV into the scope of Chapter 14 which currently excludes PV.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [UL 1703-02, UL 1741-99] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M213-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1401.1-M-STRAUSBAUGH.PMGCAC.DOC

M214–12
1404.2.1 (NEW)

Proponent: Timothy Burgos, InterCode Incorporated, Representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self
(ken@nrgcodeadvocates.com)

Add new text as follows:

1404.2.1 Protection of piping insulation. Piping insulation exposed to the weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind. The means of protection shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted as a means of such protection.

Reason: This proposal attempts to maintain consistency between the IMC and the IECC allowing the code official easier code enforcement.

This proposal was taken out of the 2012 IECC where the Committee, in their reason statement felt that this change was needed to ensure durable materials met the requirements of the code. Below is the IECC committee reason for this proposal.
Committee Reason: *Protection of outside piping insulation is necessary to assure durable materials to meet the energy code requirements. The modification simply removes the laundry list of possible protections, as the committee felt this was unnecessary.*

This reason statement below, was taken from EC110-09/10, proposed by Howard Ahern and approved as modified as printed above.

"Outdoor piping insulation needs to be protected from weather, physical damage or from UV deterioration. Pipe insulation in outdoor locations is typically protected by an aluminum or sheet metal jacket, painted canvas, plastic cover, or coating that is water retardant and UV resistant.

All AC units require periodic maintenance. The frequency varies with how hard the unit operates, exterior temperature, preventive maintenance program, and many others. In every occasion, every maintenance provides an excuse for the Freon line insulation to be touched and removed. Adhesives Tape is not permitted as it will limit maintenance and damage insulations permeability characteristics. Removal of tape damages the integrity of the original insulation into pieces, specially, if the insulation has reached thermo set state. Protection can also keep silted pipe insulation from commonly separating thus saving additional energy cost. This simple common sense proposal is cost-effective as it will save energy and will prolong insulation life reducing replacement.
This proposal will save residential building energy cost following the same initiative being taken by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) to improve energy efficiency levels by 30% in the **ASHRAE 90.1 2007 Section 6.4.4.1.1** commercial building standards. It also reflects the energy efficiency improvement approved by Congress American Recovery and Reinvestment Act of 2009 (ARRA).

ASHRAE 90.1 2007 Section 6.4.4.1.1:
Piping Insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind but not limited to the following
A. Piping Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

Cost Impact: The code change proposal will increase the cost of construction.

M214-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1404.2.1(NEW)-M-BURGOS-SAGAN.DOC

CODE CORRELATION COMMITTEE
February, 2012

Following is a compilation of editorial changes made to the 2012 I-Codes that will appear in the 2015 I-Codes. Most of these editorial changes are code change proposals received that were deemed editorial, and therefore not required to be considered by the applicable code change committee during the 2012/2013 Code Change Cycle. These are shown with the original proponent's name. Additionally, the Code Correlation Committee identified needed editorial revisions to some code provisions. In those cases, the Code Correlation Committee is listed as the proponent. The item numbers refer to committee items discussed and considered at the Code Correlation Committee Conference Call on February 22, 2012. The entire agenda of the CCC discussed on February 22 can be viewed at:
http://www.iccsafe.org/cs/CCC/Documents/Agenda/022212-EditorialIssuesGroupA.pdf

IBC

Item # CCC 12-G1

IBC

Chapter 2 - Definitions

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Manufacturers Association International
Ref: 202-Reflective Plastic Core Foil Insulation-G-Sagan

Revise as follows:

Reflective Plastic Core ~~Foil~~ Insulation. An insulation material packaged in rolls that is less than 0.5 inches thick, with at least one exterior low emittance surface (0.1 or less) and a core material containing voids or cells.

Reason: Product innovations require that the term "Reflective Plastic Core Foil Insulation" be revised with the deletion of the word "foil". Possible use of low emittance surfaces such as metalized deposits now fall into this product category and should not be excluded by the utilization of the term "foil".

Item # CCC 12-G2

IBC

Chapter 2 - Definitions

Proponent: Philip Brazil, P.E., Senior Engineer, Reid Middleton, Inc., representing Washington Association of Building Officials, Technical Code Development Committee

REF: 202-SMOKEPROOF ENCLOSURE-G-Brazil

Revise as follows:

SECTION 202
DEFINITIONS

SMOKEPROOF ENCLOSURE. An _interior_ *exit stairway* designed and constructed so that the movement of the products of combustion produced by a fire occurring in any part of the building into the enclosure is limited.

Reason: "Interior" is added before "exit stairway" because "exit stairway" includes exterior exit stairways but they are not permitted to be components of smokeproof enclosures by Section 909.20, which requires a smokeproof enclosure to consist of an "enclosed interior exit stairway…and an open exterior balcony or ventilated vestibule." Based on our analysis of the 2012 IBC, there is only one instance of "exit stairway" in provisions for or related to smokeproof enclosures, where a change to "interior exit stairway" is warranted, and it is in this proposal.

Item # CCC 12-G7

IBC

407.5.1, 407.9, Table 1018.2

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

REF: 407.5.1-G-Williams Ad Hoc

Find and replace the terms "gurney" and "litter" throughout the I-Codes with the term "stretcher."

407.5.1 Refuge area. Refuge areas shall be provided within each *smoke compartment*. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining *smoke compartment*. Where a *smoke compartment* is adjoined by two or more *smoke compartments*, the minimum area of the refuge area shall accommodate the largest *occupant load* of the adjoining compartments. The size of the refuge area shall provide the following:

1. Not less than 30 net square feet (2.8 m2) for each care recipient confined to bed or ~~litter~~ _stretcher_.
2. Not less than 6 square feet (0.56 m2) for each ambulatory care recipient not confined to bed or ~~litter~~ _tretcher_ and for other occupants.

Areas or spaces permitted to be included in the calculation of refuge area are *corridors*, sleeping areas, treatment rooms, lounge or dining areas and other low hazard areas.

407.9 Secured yards. Grounds are permitted to be fenced and gates therein are permitted to be equipped with locks, provided that safe dispersal areas having 30 net square feet (2.8 m2) for bed and ~~litter~~ _stretcher_ care recipients and 6 net square feet (0.56 m2) for ambulatory care recipients and other occupants are located between the building and the fence. Such provided safe dispersal area shall be located not less than 50 feet (15 240 mm) from the building they serve.

Table 1018.2
MINIMUM CORRIDOR WIDTH
Occupancy Width (min)

Table 1018.2

In *corridors* and areas serving ~~gurney~~ stretcher traffic in occupancies where patients receive outpatient medical care, which causes the patient to be incapable of *self-preservation.*	72 inches

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering, a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx.

Revising these terms will be more consistent with current healthcare terminology and create consistency throughout the code. The term stretcher in place of either gurney or litter in the code has no financial impact on construction.

Item # CCC 12-G9

IBC
Table 414.2.5(1)

Proponent: Jerry R. Tepe, FAIA, JRT•AIA ARCHITECT representing The American Institute of Architects

Revise as follows:

[F] TABLE 414.2.5(1)
MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES
NONFLAMMABLE SOLIDS AND NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS [d,e,f]

(No change to Table proposed – shown only for reference.)

B. Physical-hazard materials—nonflammable and noncombustible solids and liquids			
1. Oxidizers[b,c]	4	Not Allowed	Not Allowed
	3	1,150[g]	115
	2	2,250[h]	225
	1	18,000 [i,j]	1,800 [i,j]

Footnotes

g. Maximum amounts ~~are permitted to~~ shall be increased to 2,250 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
h. Maximum amounts ~~are permitted to~~ shall be increased to 4,500 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

Reason: This changes the footnote language to the imperative rather than the permissive and creates consistency of language with other footnotes (see d and e in this Table and also d and e in Table 307.1(1)). Not technical change is intended.

Item # CCC 12-G10

IBC

419.6

Proponent: Hoyt Jeter, PE Eagle Eye Consulting Engineers, P.S
Representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

Section 419.6. Floor<u>s</u> ~~loading for the areas~~ within a live/work unit shall be designed ~~to conform to~~ <u>for the live loads in</u> Table 1607.1 based on the function within the space.

Reason: The modification correlates with similar terminology used throughout the international building codes; IBC Table 1607.1 does not specify anything "to conform to" but does specify live loads required to design space, which Section 1607.3 charges.

CCC Action:

Item # CCC 12-G11

IBC

422.3, 422.4, & 422.5

Proponent: Homer Maiel, PE, CBO, Town of Atherton, Representing ICC Tri-Chapter (Peninsula, East Bay, and Monterey Bay)

REF: 422.4-G-MAIEL

Revise as follows:

422.3 Smoke compartments. Where the aggregate area of one or more *ambulatory care facilities* is greater than 10,000 square feet (929 m^2) on one *story*, the *story* shall be provided with a *smoke barrier* to subdivide the *story* into no fewer than two *smoke compartments*. The area of any one such *smoke compartment* shall be not greater than 22,500 square feet (2092 m^2). The area of any one such smoke compartment shall be not greater than 22,500 square feet (2092 m^2). The travel distance from any point in a *smoke compartment* to a *smoke barrier* door shall be not greater than 200 feet (60 960 mm). The *smoke barrier* shall be installed in accordance with Section 709 with the exception that *smoke barriers* shall be continuous from outside wall to an outside wall, a floor to a floor, or from a *smoke barrier* to a *smoke barrier* or a combination thereof.

> **~~422.4~~ <u>422.3.1</u> Refuge area.** Not less than 30 net square feet (2.8 m^2) for each nonambulatory care recipient shall be provided within the aggregate area of *corridors,* care recipient rooms, treatment rooms, lounge or dining areas and other low-hazard areas within each *smoke compartment.* Each occupant of an *ambulatory care facility* shall be provided with access to a refuge area without passing through or utilizing adjacent tenant spaces.

~~422.5~~ **422.3.2** **Independent egress.** A *means of egress* shall be provided from each *smoke compartment* created by smoke barriers without having to return through the *smoke compartment* from which *means of egress* originated.

~~422.6~~ 422.4(No change to text)

~~422.7~~ 422.5 (No change to text)

Reason: This is only an editorial change. Since Refuge Area and Independent Egress are subsections to Smoke Compartment, they need to be indented and to have subsection numbering. This section is similar to Section407.5 and 4075.1 and 407.5.2 which are correctly indented and subsectioned. .

Item # CCC 12-G12

IBC

506.1

Proponent: Kranz

Revise as follows:

BUILDING AREA MODIFICATIONS

506.1 General. The building areas limited by Table 503 shall be permitted to be increased due to frontage (If) and automatic sprinkler system protection (Is) in accordance with the following:

(Equation 5-1)

where:

Aa = Allowable building area per story (square feet).

At = Tabular building area per story in accordance with Table 503 (square feet).

If = Area increase factor due to frontage as calculated in accordance with Section 506.2.

I s = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.

506.2 Frontage increase. Every building shall adjoin or have access to a public way to receive a building area increase for frontage. Where a building has more than 25 percent of its perimeter on a public way or open space having a minimum width of 20 feet (6096 mm), the frontage increase shall be determined in accordance with the following:

(Equation 5-2)

where:

If = Area increase factor due to frontage.

F = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) open minimum width (feet).

P = Perimeter of entire building (feet).

W = Width of public way or open space (feet) in accordance with Section 506.2.1.

Reason: Adding the word “factor” after “Area increase” creates consistency with the definition of “If” in Equation 5-1 above.

CCC Action:

Item # CCC 12-G13

IBC

507.3

Proponent: Eirene Oliphant, MCP, BRR Architecture, representing self

Revise as follows:

507.3 Sprinklered, one story. ~~The area of a Group B, F, M or S building no more than one *story above grade plane* of any construction type, or~~ ~~t~~The area of a Group A-4 building no more than one story above grade plane of other than Type V construction, or the area of a Group B, F, M or S building no more than one *story above grade plane* of any construction type, shall not be limited where the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason:
While the intent of this section is to allow all types of construction for Groups B, F, M or S buildings and limit the type of construction for Group A-4, the way it is currently worded creates confusion. There are some who read this section to say that Type VB would not be a permitted construction type for an unlimited Group M building. This proposed code change is an attempt to clarify the language to clearly indicate that it is only the Group A-4 which has restrictions on the type of construction to allow unlimited area.

CCC Action:

Item # CCC 12-G14

IBC

507.5

Proponent: Jerry R. Tepe, FAIA, JRT•AIA ARCHITECT representing The American Institute of Architects

REF: 507.5-G-Tepe

Revise as follows:

507.~~5~~2 Reduced open space. The *public ways* or *yards* of 60 feet (18 288 mm) in width required in Sections 507.~~2~~3, 507.~~3~~4, 507.~~4~~5, 507.6 and 507.11 shall be permitted to be reduced to not less than 40 feet (12 192 mm) in width provided all of the following requirements are met:

1. The reduced width shall not be allowed for more than 75 percent of the perimeter of the building.
2. The *exterior walls* facing the reduced width shall have a *fire-resistance rating* of not less than 3 hours.
3. Openings in the *exterior walls* facing the reduced width shall have opening protectives with a *fire protection rating* of not less than 3 hours.

507.~~2~~3 Nonsprinklered, one story. No change.
507.~~3~~4 Sprinklered, one story. No change.
507.~~3~~4.1 Mixed occupancy buildings with Groups A-1 and A-2. No change.
507.~~4~~5 Two story. No change.

Reason:

This change simply puts the more general requirement at the front of the section and before all the referenced sections. Currently it is located in the middle of the referenced sections and is often overlooked as a result. There is no technical change proposed.

Item # CCC 12-FS1

IBC

703.2, 703.2.4(new)

Proponent: Bob Eugene/Underwriters Laboratories/Underwriters Laboratories

Revise as follows:

Relocate portions of section 703.2 to a new section 703.2.4 as follows:

703.2 Fire-resistance ratings. The fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263 or in accordance with Section 703.3. ~~Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced.~~ Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required fire-resistance rating.

Exception: <Unchanged>

<u>**703.2.4 Supplemental features.** Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced.</u>

Portions not shown remain unchanged.

Reason: Section 703.2 currently covers four distinct concepts that are jumbled together in one section and exception, which is confusing for the code user. This proposal relocates one of the concepts, covering supplemental materials to its own section without making any changes to existing text.

CCC Action:

Item # CCC 12-FS2

IBC

703.2, 703.2.5(new)

Proponent: Bob Eugene/Underwriters Laboratories/Underwriters Laboratories

Revise as follows:

703.2 Fire-resistance ratings. The fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required fire-resistance rating.

703.2.5 Exterior bearing walls ~~**Exception:**~~ In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 or UL 263 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119 or UL 263, the fire exposure time period, water pressure and application duration criteria for the hose stream test of ASTM E 119 or UL 263 shall be based upon the fire-resistance rating determined in accordance with this section ~~exception~~.

(Portions not shown remain unchanged.)

Reason: Section 703.2 currently covers four distinct concepts that are jumbled together in one section, which is confusing for the code user. This proposal takes the requirements in the exception, and moves them with no text changes to a new section on exterior load bearing walls. Relocating these requirements to a new section will make it easier for code users to locate them. The current arrangement is confusing since the exterior bearing wall requirements were not really an exception to the base requirements.

Item # CCC 12-FS7

IBC
704.2

Proponent: Homer Maiel, PE, CBO, Town of Atherton, Representing ICC Tri-Chapter (Peninsula, East Bay, and Monterey Bay)

Revise as follows:

704.2 Column protection. Where columns are required to have protection to be fire-resistance rated, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column ~~length~~ height, including connections to other structural members, with materials having the required *fire-resistance rating*. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

Reason: This is only an editorial change. The word “length” associates with horizontal measurements. The word “height” on the other hand associates with vertical measurements and more appropriate for column.

<u>Item # CCC 12-FS8</u>

IBC

704.2, 704.4

Proponent: Maureen Traxler/City of Seattle Dept of Planning & Development/ City of Seattle Dept of Planning & Development

Revise as follows:

704.2 Column protection. Where columns are required to have protection to <u>achieve a fire-resistance rating</u> ~~be fire-resistance rated~~, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column length, including connections to other structural members, with materials having the required fire-resistance rating. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

704.4 Protection of secondary members. Secondary members that are required to have <u>protection to achieve</u> a *fire-resistance rating* shall be protected by individual encasement protection, by the membrane or ceiling of a *horizontal assembly* in accordance with Section 711, or by a combination of both.

Reason: This proposal is intended to bring consistency to the terminology and provisions for individual encasement of structural members. Sections 704.2, 704.3 and 704.4 all require individual encasement for members that are required to have fire-resistance rating. However, Sections 704.2 and 704.3 require it only for members that require additional protection to get the required rating. For example, heavy timber columns would not be required to be individually encased. This proposal adds that same provision to Section 704.4 so that secondary members will also only be required to be individually encased if they need additional protection to get the required rating. This distinction that individual encasement is required only for members that require additional protection was introduced into these sections in the 09/10 code cycle by code change FS9-09/10.

This proposal also revises Section 704.2 so that the terminology is consistent in all three sections.

<u>Item # CCC 12-FS12</u>

IBC

708.1

Proponent: Al Godwin, CBO, CPM, Aon Fire Protection Engineering representing same.

Revise as follows:

IBC amend Section 708.1 to add an item 6 to read as follows:

708.1 General. The following wall assemblies shall comply with this section.

1. (no change)
2. (no change)
3. (no change)
4. (no change)
5. (no change)
6. <u>Egress balconies as required by Section 1019.2.</u>

Reason: The laundry list might as well be complete.

Item # CCC 12-FS17

IBC

Chapter 8

Proponent: Marcelo M. Hirschler/GBH International

Revise as follows:

Please revise the order of the sections so that all sections addressing individual materials follow each other. This means that sections 803.12 and 803.13 should be to immediately follow section 803.8. The order would then remain as shown below.

803 Wall and Ceiling Finishes
803.1 General
803.2 Thickness exemption
803.3 Heavy timber exemption
803.4 Foam plastics
803.5 Textile wall coverings
803.6 Textile ceiling coverings
803.7 Expanded vinyl wall coverings
803.8 Expanded vinyl ceiling coverings
803.9 High density polyethylene and polypropylene
803.10 Site-fabricated stretch systems
803.11 Interior finish requirements based on group
803.12 Stability
803.13 Application of interior finish materials to fire resistance-rated or noncombustible building elements

Reason: Section 803 addresses wall and ceiling finishes and its flow is not logical at present.

Section 803 correctly starts with a general section (that includes the test methods, 803.1) and follows with the exemptions (thin materials and heavy timber, 803.2 and 803.3) before starting a section on various interior finish materials that require special attention to their testing (803.4 to 803.8). It then moves to requirements based on group (803.9), stability (803.10) and application of interior finish to certain building elements (803.11). It ends by returning one more time to some interior finish materials that require special attention (803.12 and 803.13). High density polyethylene, polypropylene and site-fabricated stretch systems, the materials addressed in the last two sections, should be included in the initial sequence of materials and become sections 803.9 and 803.10. Then sections 803.9 to 803.11 should be renumbered to become 803.11 to 803.13.

There is no change in requirements or even in code language proposed.

Item # CCC 12-E5

1008.1.2 (IFC [B] 1008.1.2)

Proponent: William E. Koffel, P.E., Koffel Associates, Inc. representing Won-Door Corporation

Revise as follows:

1008.1.2 (IFC [B] 1008.1.2) Door swing. Egress doors shall be of the pivoted or side-hinged swinging type.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.

4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress .
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

1008.1.2.1 (IFC [B] 1008.1.2.1) Direction of Swing. Swinging d~~D~~oors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

Reason: The location of the requirement for doors to swing in the direction of egress travel has been misinterpreted to apply to horizontal sliding doors since it is located after the exceptions, thereby limiting the application of horizontal sliding doors to an occupant load of less than 50. It should be noted that Section 1008.1.4.3 does not restrict the use of horizontal sliding doors in Group A occupancies or any other occupancy with an occupant load of 50 or more.

Consideration was given to moving the sentence to before the exceptions but if that is done, one might use Exception #1 to override the requirement to swing in the direction of egress in Group H occupancies, regardless of occupant load.

Item # CCC 12-E7

IBC

1013.6, 1013.7 (IFC [B] 1013.6, 1013.7) (IMC [B] 304.11, 304.12(New))

Proponent: Kim Paarlberg

Revise as follows:

1013.6 (IFC [B] 1013.6; IMC [B] 304.11) Mechanical equipment. Guards shall be provided where appliances, equipment, fans~~, roof hatch openings~~ or other components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inches (533 mm) in diameter. The guard shall extend not less than 30 inches (762 mm) beyond each end of such appliance, equipment, fan or component.

1013.7 (IFC [B] 1013.7; IMC [B] 304.12) Roof access. *Guards* shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent passage of a sphere 21 inches (533 mm) in diameter.

Reason: The current requirements for guards for mechanical equipment and roof access is the same, so taking 'roof hatch opening' out of the list in Section 1013.6 is eliminating duplication with 1013.7. Also, Section 1013.6 is in the Intenational Mechanical Code, but roof access is not. It seems like this since the roof hatch provides access to the equipment, and the IMC text currently includes "roof hatch opening", that it would be consistent to add it to the IMC.

<u>Item # CCC 12-E8</u>

IBC

1018.2 (IFC [B] 1018.2)

Proponent: Maureen Traxler, City of Seattle Department of Planning and Development, representing City of Seattle Department of Planning and Development

Revise as follows:

1018.2 (IFC [B] 1018.2) Width. The minimum width of *corridors* <u>shall be as</u> specified in Table 1018.2, <u>and</u> shall be <u>not less than</u> as determined in Section 1005.1.

Reason: The language in Section 1018.2 of the 2012 IBC is very difficult to understand and apply. This code change proposal revises the language to provide that the minimum width of corridors is calculated according to Table 1018.2 which includes minimum corridor widths based on occupancy and occupant load. Section 1005.1 also provides minimum widths that are generally applicable to means of egress components, including corridors. The proposed language expresses the relationship more clearly.

<u>Item # CCC 12-E10</u>

1025.4 (IFC [B] 1025.4)

Proponent: Kim Paarlberg

Revise as follows:

1025.4 (IFC [B] 1025.4) Capacity of refuge area. The refuge area of a *horizontal exit* shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original *occupant load* of the refuge area plus the *occupant load* anticipated from the adjoining compartment. The anticipated *occupant load* from the adjoining compartment shall be based on the capacity of the *horizontal exit* doors entering the refuge area.

<u>**1025.4.1 (IFC [B] 1025.4.1) Capacity of refuge area.**</u> The capacity of the refuge area shall be computed based on a *net floor area* allowance of 3 square feet (0.2787 m2) for each occupant to be accommodated therein.

> **Exception:** The *net floor area* allowable per occupant shall be as follows for the indicated occupancies:
>
> 1. Six square feet (0.6 m^2) per occupant for occupancies in Group I-3.
> 2. Fifteen square feet (1.4 m^2) per occupant for ambulatory occupancies in Group I-2.
> 3. Thirty square feet (2.8 m^2) per occupant for nonambulatory occupancies in Group I-2.

<u>**1025.4.2 (IFC 1025.4.2) Number of exits.**</u> The refuge area into which a *horizontal exit* leads shall be provided with *exits* adequate to meet the occupant requirements of this chapter, but not including the added *occupant load* imposed by persons entering it through *horizontal exits* from other areas. At least one refuge area exit shall lead directly to the exterior or to an *interior exit stairway* or *ramp*.

> **Exception:** The adjoining compartment shall not be required to have a *stairway* or door leading directly outside, provided the refuge area into which a *horizontal exit* leads has *stairways* or doors

leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

Reason: Separating this section into parts is editorial and will add additional clarity, especially for application of the exceptions.

Item # CCC 12-E15

IBC

Table 1106.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1106.1 Required. Where parking is provided, accessible parking spaces shall be provided in compliance with Table 1106.1, except as required by Sections 1106.2 through 1106.4. Where more than one parking facility is provided on a site, the number of parking spaces required to be accessible shall be calculated separately for each parking facility.

TABLE 1106.1
ACCESSIBLE PARKING SPACES

TOTAL PARKING SPACES PROVIDED IN PARKING FACILITIES	REQUIRED MINIMUM NUMBER OF ACCESSIBLE SPACES

(Portions of table not shown remain unchanged.)

Reason: The title in the table should match the requirement in text. This will also match ADA Table 208.2.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

1106.1#1-E-BALDASSARRA-CTC.docx

Item # CCC 12-E16

IBC

1108.2.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

1108.2.2 Wheelchair spaces. In ~~theaters, bleachers, grandstands, stadiums, arenas and other fixed seating~~ rooms and spaces used for assembly ~~areas~~ purposes with fixed seating, accessible wheelchair spaces shall be provided in accordance with Sections 1108.2.2.1 through 1108.2.2.4.

Reason: The proposal better harmonizes with the ADA (Section 221.2) by deleting a list of spaces that is not included in the requirements of ADA and clearly applying the requirement to spaces with fixed seating. Spaces having fixed seating are not limited to the laundry list that is proposed to be deleted by this proposal. Both the IBC and ADA require wheelchair spaces where there are as few as 4 fixed seats. The laundry list would likely have many more than 4 seats while other spaces potentially having as few as 4 fixed seats are not included within the list. Therefore, the list should be deleted and it should be clarified that these requirements apply to those spaces with fixed seating.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Item # CCC 12-E19

IBC
Table 1018.2 (IFC [B] Table 1018.2)

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care

Revise as follows:

1018.2 (IFC [B] 1018.2) Width. The minimum width of corridors specified in Table 1018.2 shall be as determined in Section 1005.1.

Table 1018.2 (IFC [B] Table 1018.2)
MINIMUM CORRIDOR WIDTH

Occupancy	Width (min)
Any facilities not listed below	44 inches (1118 mm)
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches (610 mm)
With a required occupancy capacity less than 50	36 inches (914 mm)
Within a dwelling unit	36 inches (914 mm)
In Group E with a corridor having a required capacity of 100 or more	72 inches (1829 mm)
In corridors and areas serving gurney traffic in ~~occupancies where patients receive outpatient medical care, which causes the patient to be incapable of self-preservation~~ ambulatory care facilities	72 inches (1829 mm)
Group I-2 in areas where required for bed movement	96 inches (2438 mm)

Reason: The language in the 2009 table conflicts with language found in chapter 2’s definition for Ambulatory Care Facilities. The definition for Ambulatory Care Facilities addresses the ability of the patients in this section appropriately. Using the previously defined term will simplify and clarify the table. The size of the stretchers or gurneys are the same as any typical stretcher or gurney (average 74”L x 22”w) and under normal situations are able to be moved in aisle widths as narrow as 36” (typically this size stretcher is used in the field by EMT’s in typical residential occupancies) however, 72” aisles are needed in Ambulatory Surgery Facilities because of the additional equipment that may be attached to a stretcher or gurney such as I.V poles, monitors and the multiple staff that may be involved in moving a patient to or from surgery under normal circumstances or in emergencies, hence, the only reason that Ambulatory Surgery Facilities require the wider aisle width)

Additionally, Ambulatory Care Facilities utilize stretchers or gurneys which are much narrower than a hospital bed, which is intended for overnight stays (overnight stays are not allowed in Ambulatory Surgery Facilities). Group I-2 hospitals require wider aisles for movement of these larger beds and this chapter dictates that I-2 Occupancy aisles used for movement of patient beds be 96”.

This proposal is submitted by the ICC Ad Hoc Committee on Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.

Cost Impact: None

CCC Action:

<u>Item # CCC 12-E20</u>

IBC
1009.13.1, 1009.14 (IFC [B] 1009.13.1, 1009.14)

Proponent: David W. Cooper, Stairway Manufacturing and Design Consultants representing Stairway Manufacturers' Association

Revise as follows:

1009.13.1 (IFC 1009.13.1) Handrails of alternating tread devices. *Handrails* shall be provided on both sides of *alternating tread devices* ~~and shall comply with section 1012~~.

1009.14 (IFC [B] 1009.14) Ship ladders. Ship ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupied roofs. <u>The minimum clear width at and below the *handrails* shall be 20 inches (508 mm).</u>

<u>**1009.14.1 (IFC [B] 1009.14.1) Handrails of ship ladders.** *Handrails* shall be provided on both sides of ship ladders.</u>

<u>**1009.14.2 (IFC [B] 1009.14.2) Treads of ship ladders.**</u> Ship ladders shall have a minimum tread depth of 5 inches (127 mm). The tread shall be projected such that the total of the tread depth plus the *nosing* projection is no less than 8 1/2 inches (216 mm). The maximum riser height shall be 9 1/2 inches (241 mm).

~~*Handrails* shall be provided on both sides of ship ladders~~. ~~The minimum clear width at and below the *handrails* shall be 20 inches (508 mm).~~

Reason: The reference to section **1012 Handrails** is unnecessary, superfluous and has been stricken. It is clearly understood that all handrail requirements for stairs, ramps, alternating tread devices, and ship ladders are located there as well as applicable exceptions for alternating tread devices and ship ladders.

This is a simple reorganization without change to the text or meaning. The intent is to model the format established by the preceding section,1009.13 Alternating tread devices to aid in understanding and compliance.

<u>Item # CCC 12-S7</u>

IBC
1507.4.2

Proponent: ***Name/Company/Representing (***

Bonnie Manley, P.E., American Iron and Steel Institute

Revise as follows:

1507.4.2 Deck slope. Minimum slopes for metal roof panels shall comply with the following:

1. The minimum slope for lapped, nonsoldered seam metal roof~~s~~ <u>panels</u> without applied lap sealant shall be three units vertical in 12 units horizontal (25-percent slope).
2. The minimum slope for lapped, nonsoldered seam metal roof~~s~~ <u>panels</u> with applied lap sealant shall be one-half unit vertical in 12 units horizontal (4-percent slope). Lap sealants shall be applied in accordance with the *approved* manufacturer's installation instructions.

3. The minimum slope for standing seam metal ~~of~~ roof panel systems shall be one-quarter unit vertical in 12 units horizontal (2-percent slope).

Reason: These minor editorial modifications bring consistency to the terminology used throughout the section.

CCC Action:

Item # CCC 12-S8

IBC
1510.3

Proponent: Bonnie Manley, P.E., American Iron and Steel Institute

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof panel systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.
4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

Reason: Minor editorial modification corrects terminology to reflect what is used in Section 1507.4.